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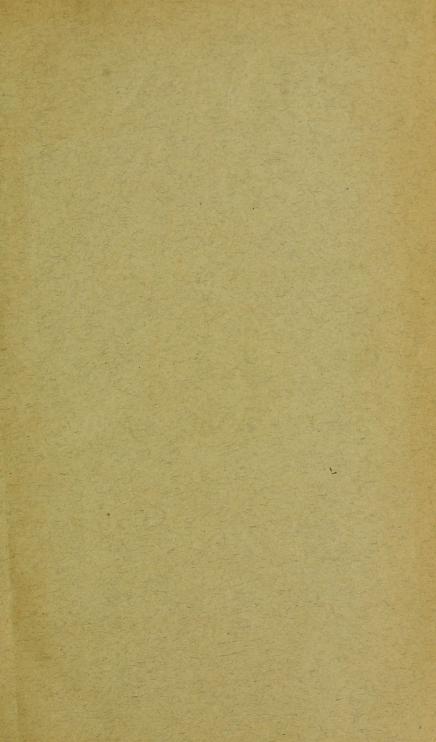


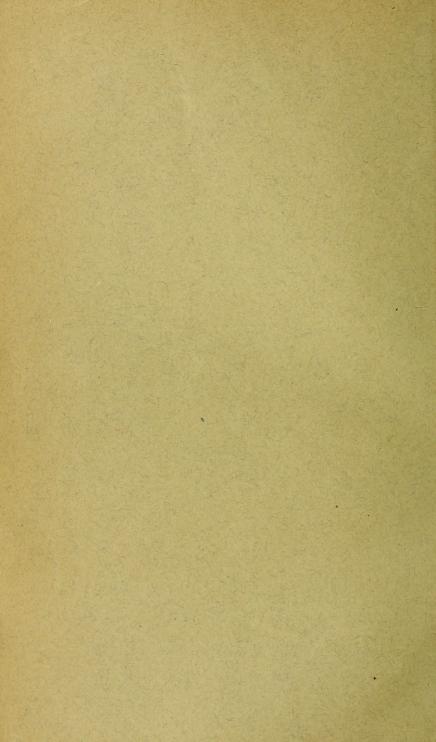
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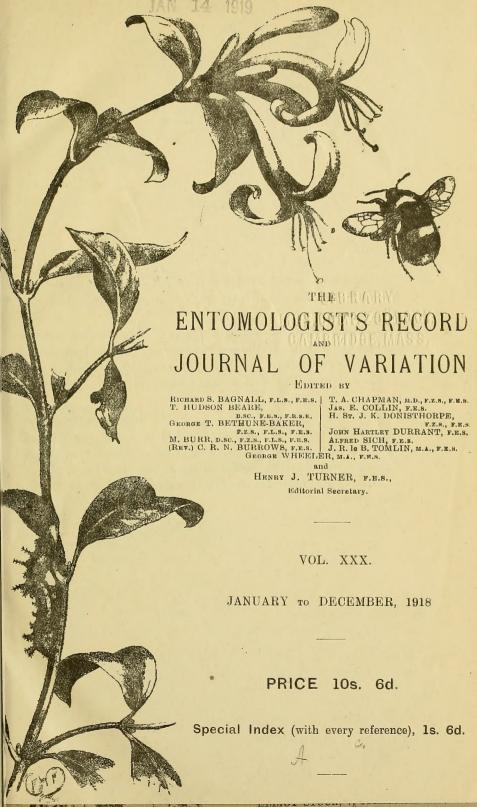
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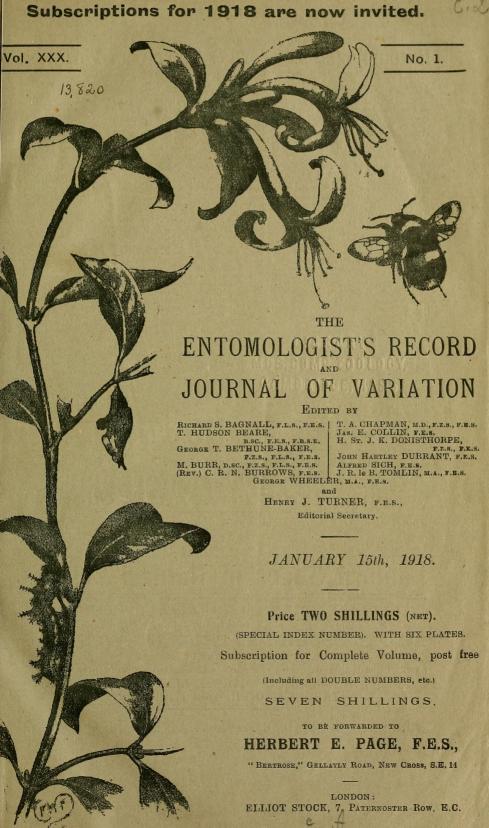
We have successfully carried on during the time of stress and now that the worst is over we hope our subscribers will continue their support

Unfortunately circumstance, the nature of which by now everyone is aware, compels us to raise our subscription. It has been decided by our associated editors that ten shillings is to be the subscription for the year 1919. Let us hope that we may not have to keep it so for long.

Numerous important articles have already come in for the ensuing year, but we wish to ask our readers to send us useful general notes, scientific notes, collecting notes, paragraphs of special interest, and aught, personal or otherwise, that entomologists should know.

With kindly greeting to one and all we go forward to our thirty-first volume.

H.J.T.



READ THE BACK Nos. OF THE

Entomologist's Record & Journal of Variation (Practical Hints, Field Work, etc. useful for every year's collecting).

VOL. VI.

The TITLES of some of the articles are as follows:—Notes on Butterfly Pupæ, with some remarks on the Phylogenesis of the Rhopalocera."—Dr. T. A. Chapman, F.E.S., "Phytophagic Species."—Prof. A. Raddiffe Grote, M.A. "Varieties and aberrations of Nocture from Doncaster."—H. H. Corbett, M.R.C.S. "The fremulum of the British species of Smerinthus."—G. G. Griffiths, F.Z.S., F.E.S. "Endryas stæ-johannis."—A. Raddiffe Grote, M.A. "Parthenogenesis or Agamogenesis."—J. W. Tutt, F.E.S. "Larvæ."—Rev. G. M. A. Hewitt, M.A. "Parthenogenesis or Agamogenesis."—J. W. Tutt, F.E.S. "Generic Names in the Noctuidæ."—Proc. A. R. Grote, M.A. "Pupa hunting in October."—J. W. Tutt, F.E.S. "Polygamy and Polyandry in Moths." "The nature of certain insect colours."—W.S. Riding, M.D., R. Freer, M.B., J. W. Tutt, F.E.S., Rev. G. R. N. Burrows, J. Anderson, Jun. "The Lepidopters of Swansca."—Major R. B. Robertson. "Caradrina ambigua in the Isle of Wight."—A. J. Hodges. "The insects of Bourg St. Maurice."—J. W. Tutt, F.E.S. "Corrhodia errythrocephala ab. glabra from Devonshire and comparison with O. vaccinii."—Dr. W. S. Riding, F.E.S. "Notes on Caradrina ambigua and C. superstes."—J. W. Tutt, F.E.S. "Entomology and Entomologists, being the Annual Address to the City of London Entom. Society." Notes on Aphomia sociela." (with plate).—W. P. Blackburne Maze, F.E.S. "Apterous females and Winter Emergence"—E. F. Studd, M.A., B.C.L., F.E.S., L. B. Prout, F.E.S. "Collecting Noctuide by Lake Erie."—A. Raddiffe Grote, M.A. "Colcoptera at Ipswich."—Claude Morley, F.E.S. "Notes on Bombus visurgie." "Synonymic Notes on Acidaia humilata and A. dilutaria."—L. B. Prov. F.E.S. "The Lepidoptera of Grésy-sur-Aix."—J. W. Tutt, F.E.S. "Apatura iris."—Rev. G. M. A. Hewett' "Soheme of Classification of the Rhopalocera founded on the structure of the Pupæ. "—T. A. Chapman, M.D., F.E.S. "Hadenoof of the Rhopalocera founded on the structure of the Pupæ."—J. W. Tutt, F.E.S. "The British representatives of the Genus Caradrina."—J. W. Tutt, F.E.S. "Hadenoof disappearan

W.D., F.E.S.

Besides these articles, a large number of short notes are contained in every number under the following titles: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Lifehistories," "Notes on Collecting," "Current Notes." The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month are quite unique.

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The Entomologist's Recond

JOURNAL OF VARIATION.

Vol. XXX. No. 1.

JANUARY 15th, 1918.

Lepidopterology.—Two new European Lycanids. By T. A. CHAPMAN, M.D., F.E.S.

In the 14th volume (Fascicule) of Études de Lépidoptérologie comparée, M. Oberthür enquires whether in such times as these one ought to continue the pursuit of science; the difficulties are great, but he says time goes on all the same, age advances, for how long can he continue to work? To publish scientific works is to serve one's country, a little effort, no matter how little (we all know that M. Oberthür's slight efforts would be a great deal for most of us), is better than stopping what is already begun, he therefore decides to carry forward the objects he has in view. M. Oberthür is essentially a poet, and he expresses these conclusions and the reasons for them in the clear and artistic manner to which the French language so beautifully lends itself in his hands. He quotes a fine passage from Victor Hugo (written about 1836), defending the activity of the artist in trying times, and giving examples of how art is actually stronger and richer at such epochs. But this preface must be read, to reduce it to a resumé is to spoil it.

The volume begins with "Contributions to the history of Lycaena

argus, and the forms, races, and species hitherto included in it."

[Most British Lepidopterists (Tutt, South, Wheeler, etc.) having, following Staudinger, accepted the name argus for our British species aegon, it is necessary, therefore, to begin by pointing out that M. Oberthür uses the name for the non-British species, for which they accept the name argurognomon.]

A magnificent form of this insect is found in M. Oberthür's country, the Armorican peninsula, and justly increases M. Oberthür's interest in the species. This form (armoricana) is richly coloured and has large and bold markings, there is no other similar race described, nor ap-

parently do aberrations often approach it.

The first contribution is "On the genital armature of Lycaena argus

and its varieties," by Dr. J. Reverdin.

The second is the "Opinion of Dr. Courvoisier," and the third is "A New European Lycaena, Plebeius argus (argyrognomon) and aegus

sp. nov.," by myself.

The forms that M. Oberthur specially suggested as requiring examination included armoricana, ligurica, bellieri, and alpina, forms with definitely distinct facies. Dr. Reverdin says his first results were that there were sufficiently striking differences between ligurica and

armoricana, but it was evident that he must extend the examination to all the forms that he could obtain. From his own collection and by aid of various friends he obtained specimens from various parts of France, Switzerland, Italy, Germany, Austria, and Asia. He mounted the armature of 193 examples, a large number being necessary because many of the preparations are more or less unreliable from the difficulty of getting the structures so spread as to be easily observed and compared. He does not consider that he has examined a sufficiency of specimens to give his conclusions with confidence except in regard to argus, armoricana, and liqurica. He is of opinion that these three are distinct species, but with a good many provisoes, liqurica he so regards with some, but not complete, confidence, armoricana is, he thinks, decidedly more doubtful. The view he says is founded entirely on anatomical grounds, and he cannot always distinguish them in any other way, and he questions whether possibly anatomical differences without others quite suffice. He reminds us that bellieri (from Corsica) cannot be separated anatomically from argus, yet its general facies is so different, that no confusion with typical argus is possible.

My observations agree exactly in detail with those of Dr. Reverdin, but the confidence with which I formulate conclusions is in some

instances greater, in some less than Dr. Reverdin's.

The number of preparations I made was not quite so great as did Dr. Reverdin, but my technique must be rather better, as very few of them failed to be perfect, if not artistically, at least for all practical purposes of detailed examination.

The conclusions I reached are that there are the following distinct

species :-

argus (argyrognomon), Europe. ligurica, Europe (aegus mihi). micrargus, China and Japan. melissa, North America.

(scudderi, North America, no authentic specimens obtained for examination, those obtained, too few to depend on, were only melissa.)

sareptensis, n. sp., Sarepta (Volga valley?).

The one error into which I fell in my paper, for want of first hand evidence, is corrected by Dr. Reverdin. This refers to the new species liqurica. I find I was in error in taking Dr. Courvoisier's liqurica as the type of that form. He calls attention to the circumstance that though he suggested the name, its publication by him, in Iris, did not take place till 1911, and in the meantime it appeared in the Etudes de Lépidoptérologie comparée in 1910, in Fasc. iv. M. Oberthür describes it on p. 200, noting the orange band extending to the extremities of the wings and the white outer borders of the ocelli. The type is the form from Cernobbio figured pl. xli., fig. 293, which does not, however, show the white border very distinctly, and knowing M. Culot's accuracy made me doubt its being the same as the insect from Versoix and Veyrier. M. Oberthür associates with it, as the same species, the Chinese micrargus. He also, however, says the Swiss insect is ligurica, though Dr. Courvoisier's species is only noted as "analogue." The type, therefore, of *ligurica* is not Dr. Courvoisier's insect, but M. Oberthür's from Cernobbio. The question, then, as to the correct name of the new species obviously turns on the Cernobbio insect. The only way to settle the point was to examine the appendages of that form, and Monsieur Oberthür very kindly sent me a specimen, a cotype, of argus var. ligurica from Cernobbio. This specimen, in its appendages and its androconia quite agrees with the Swiss and other forms of the new species. The falces are, in fact, rather longer than is usual in the Genevan specimens, but agree with them in every other respect. The difference does not exceed the amount of variation one finds within specific limits in other species and groups. The new species is, therefore, Plebeius ligurica, and my name aegus falls as merely a synonym or varietal name for the Geneva race. It is to be regretted that the type of ligurica was not included in the first examinations, which would have prevented my falling into so undesirable an error. The mistake involves a question of nomenclature and not one of the actual facts under consideration.

My paper is illustrated by twenty plates from photographs. M. Oberthür most kindly agreed to my request for half a dozen of the blocks for these plates to illustrate this resumé. These do not of course illustrate the subject so well as all the plates do, but for the present

purposes they are quite sufficient.

Plebeius argus.—The appendages are represented in Plate I. (VII. in Études) from a specimen from Cettinje, taken by our regretted friend Mr. Gibbs. I find trifling variations from each other in my preparations of argus, variations that are as great between specimens of one race from one locality as between different races. Dr. Reverdin says that the characters are different in argus, armoricana, and ligurica, but ligurica differed more from the two others than they do from each other.

Dr. Reverdin notices that armoricana differs from argus in greater length of uncus, a deeper concavity behind the toothed end of the clasper, and a rounder extremity to this margin. I have not been able to find any such differences, and Dr. Reverdin's plates 1 and 2 do not appear to demonstrate the two first, but show a rounder end to the toothed margin of the clasp. As regards this difference, it, like the others, is the subject of much individual variation. It is not one that attracted my attention, no one form constantly differing from any other. My plate (V. in Fasc.), not reproduced here, is therefore unbiassed evidence, it shows armoricana so far as it differs, to have a less rounded margin than the forms alpina and bellieri. On the other hand it happens to show armoricana with the subterminal angle less marked than in the others; but I have a specimen of armoricana with an angle at least as sharp as the average, and I have one specimen of Swiss argus with an angle nearly as small as in ligurica, and others as small as average armoricana. These variations seem fully to justify my conclusion that the variations within the limits of what I call argus are only variations, and are to be found in almost any race, though the average of each race does in some item or other differ a little from that of other races, as a variation of this sort, some specimens of var. nivea (Pfynwald) have the toothed extremity very broad, beyond what I happen to have met with in other races. There are, no doubt, many well-marked geographical races of argus (argyrognomon) of which perhaps armoricana, bellieri, and nivea are the most marked, sufficiently so to be easily definable, but if they are therefore to be called not varieties

or races, but species, it must be done with practically no support from the structure of the male appendages.

Plate I. (VI. in Études), fig. 1 shows the whole of the male appendages of *Plebeius argus* \times 30 diameter. Fig. 2, the dorsal armature \times 45, and fig. 3, the end of the clasp \times 90. These can be compared with the appendages of *Plebeius ligurica*.

In Plate II. (VII. of $\acute{E}tudes$) I have reproduced three examples of $ligurica \times 30$, as being a new species it seemed desirable to show that its differences from argus are constant, as is illustrated by my other preparations. These differences are seen in the dorsal armature, of which the lateral portions are longer, larger, and of different form, more easily seized is perhaps the form of the falces, which have the terminal straight portion longer, straighter, and narrower than in argus. The ends of the clasps that carry the teeth are practically without the angle below the end, and the teeth are smaller, etc. The ædeagus, as Dr. Reverdin notes, is rather larger than in argus. The three specimens are from different points in the Geneva locality.

In Plate III. (IX. in Études) are shown, \times 30, the appendages of the American Plebeius melissa, figs. 7 and 8, and the Eastern Asiatic P. micrargus, fig. 9. These are both much more like ligurica than argus, but there appears to be sufficient difference in the appendages to show that they are distinct specifically from it, and from each other. I have no desire to pronounce strongly on this point, as my material was not abundant, though I examined a good many of each form.

I have, however, little doubt that melissa from California and from Toronto are specifically identical. My specimens, supposed to be scudderi, were identical with melissa, so I think that I have not had specimens of the true scudderi. Specimens of micrargus from Amoor, China, and Japan, were (so far as appendages showed) all one species, though those from each locality appear to have received separate names to the extent of nearly a score. Most of these I have not examined, but from their facies and the intermediate position of their localities I have little doubt I am correct in calling them all micrargus, which seems to be the oldest name.

In Plate IV. (XII. in Études) are shown the appendages of a species. of which specimens were given me by Mr. A. H. Jones and Mr. W. G. Fig. 10, the whole appendages, \times 30; Fig. 11, the dorsal armature, \times 45; and fig. 12, the end of the clasp, \times 90. It will be seen that these are quite distinct from any of the other species so far considered, but perhaps nearest to melissa, the American species. The straight portion of the falces looks very long, being straight and slender, and the end of the clasp is very short, broad and straight. Études I give the exact measurements of some of these points of difference. That a form most nearly related to melissa should occur in extreme Eastern Europe is remarkable, of course the area of its habitat, of which only Sarepta has (so far as I know) been sampled, remains unknown, but is probably considerable, possibly a large part of the basin of the Volga, from various parts of which argus has been recorded. These records may really refer to argus, but possibly belong to sarentensis, a name to which this new species seems to be entitled.

Plate VI. (XX. in Etudes) shows, in characteristic examples photographed by Mr. Tonge, the differences that may almost always be

detected between argus and ligurica, though occasionally specimens occur that are not too typical. The differences are more decided in the males than in the females.

The chevron marks of the marginal ocelli, are arrowhead shaped in argus, and invade the orange portions of the ocelli, making really distinct ocelli, whereas in ligurica the orange portions are free to unite into a band along which a nearly straight line could be drawn, the chevrons being crescent-shaped. The outer element of the ocelli, corresponding to the orange on the inner side, is white in ligurica, in argus is of the same colour as the general ground colour of the wing, and therefore white only in var. nivea and allied varieties!

Ligurica, sareptensis, and micrargus differ from argus in the marginal ocelli, the black basal element being arrow-shaped in argus, crescent-shaped in the other three, in which also the outer pale element is white, whatever the general colour of the wing, in argus it is the same as the general colour, and therefore only white in var. nivea. Of micrargus and sareptensis I have very few specimens, so that my diagnosis of these may be open to great correction; so far as it goes, it depends on the

post-discal row of spots.

In micrargus and liqurica they tend to be small and rather near the hind margin. In sareptensis they are larger, the fifth spot comes almost under the discal spot, forming an angle with the other spots, that is usual in "Blues," but is not very evident in micrargus and liqurica. The sixth (double) spot is very oblique in sareptensis, pointing, through or close to the fifth, to the discal spot. This spot is much more upright in micrargus and liqurica, and points outside the discal spot. In the hindwing a line through the first and sixth spots passes through the discal spot, or very nearly so, in all three species. In liqurica the seventh spot is basal to this line. In sareptensis it is on the line, and in micrargus the seventh spot is distal to this line. This character is not constant in micrargus, but I do not find it in any examples of the other species.

In giving these points in definition of the several species, I only suggest them as approximate and in some degree useful, but in many specimens not sufficiently pronounced to be depended on. The true distinctions are to be found in the appendages, in which the variations in each species do not extend far enough to lead to its being confused with any other. The same may almost be said of the androconia,

though here the variations are greater.

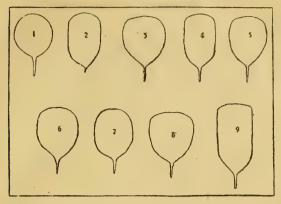
Dr. Courvoisier's paper refers almost entirely to the androconia, and on their characters he says that argus, armoricana, bellieri, ligurica, and nivea are all species distinct from each other. My own statement was "the evidence of the androconia is strongly in favour of Plebeius aegus (ligurica) being one species and all the other European forms of argus being another. It is perhaps not quite decisive, for this reason, that in both aegus and argus there is considerable variation." Studying them with the advantage of Dr. Courvoisier's paper and the figures he gives, I do not find sufficient reason for altering my opinion. Dr. Courvoisier's figures and the notes on them suggest that he did not examine many specimens. For example he says the scales on argus have 10-11 lines. I find that seven specimens from one locality, present—1 specimen chiefly 8 lines; 2, chiefly 8 to 10; 1, 9 to 13; 1, 10 to 12; and 2, chiefly 11. To bellieri he accords 13 to 14, one of

my specimens shows 10 to 11, and equally the number of dots in a line is 10, and not 12 to 13 as Courvoisier finds. I am therefore confirmed in my statement, that different individuals of the same race, and to some extent different scales on one individual differ so much, that only by very general definition can liqurica be distinguished from argus, and the various forms of the latter are hardly at all different, certainly not to a specific amount. I may add perhaps that he gives 13 to 14 rows to var. nivea from Pfynwald, with 10 to 11 dots, my Pfynwald specimens show 8 to 13 rows and 8 to 9 dots, whilst one from Lago di Garda shows 8 to 9 rows with 8 to 9 dots, again showing, accepting Dr. Courvoisier's figures, that this race, like the others, has great variation in these details. Taking the outlines of Dr. Courvoisier's figures, he gives for argus very much the form that more or less characterises the whole species; my nivea have a similar form, but Dr. Courvoisier's figure shows them much more circular. Bellieri he shows quite circular, some scales approach this, but in this form, as in others, the mass of the androconia are of the usual argus quadrilateral outline. Liqurica is more nearly circular on the average than argus, and Dr. Courvoisier's figures may be taken as fairly representative. It results that, as I stated, argus has a more or less quadrilateral outline, that is, it has somewhat straight sides, diverging a little with rounded ends, whilst liqurica (aegus) is more nearly rounded. This distinction applies to the majority of the scales, but each varies very much, so that specimens are easily found that differ very little. In sareptensis the outline is also quadrilateral as in argus, but the two sides are parallel. In micrargus the end of the scale is much less rounded, so that there is a definite angle where the side meets the end. Melissa has a similar outline to micrargus as to the squareness of the end with an angle, but the scale is proportionally much shorter and so appears

All these distinctions are founded, except as to argus and ligurica, on too few specimens to enable me to say how far they are constant, but they are sufficiently marked to be characteristic, and would require a much wider variation than occurs in argus to prevent their being distinctive. In Plate V. (XIX. of Études) are photographs of fairly characteristic androconia of argus and of ligurica (aegus). They show a difference that I have so far omitted to call attention to, namely, that in ligurica these scales not only differ in form from those of argus but also in size, being obviously smaller. Argus is 0.058mm. long, including the shafts, 0.081mm. broad, ligurica 0.052mm. long and 0.026mm. broad, but in addition to the total length, the larger proportion of the total length is in the scale and less in the shaft in argus than in ligurica, the shafts are similar in length, the scale longer in argus.

I ought perhaps to conclude that I consider the structure of the appendages establishes the species I have referred to, and gives no support to other forms of argus found in Europe being distinct. At the same time, other evidence, as of early stages, etc., might show some of them, as armoricana, nivea, and bellieri, to be nevertheless specifically

distinct, though of this I am very doubtful.



Androconia. Rough sketches × about 400.

Fig. 1. Plebeius ligurica, usual form 11 rows of dots, type and Swiss.

Fig. 2. Plebeius ligurica, one Swiss specimen has most scales like this, 12 rows of dots.

Fig. 3. Plebeius argus (argyrognomon), most specimens have the majority of their scales like this.

Fig. 4. Plebeius argus, a form dominant in one specimen from a locality from which five other specimens agreed with fig. 3.

Fig. 5. Plebeius argus var. nivea (Pfynwald).

Fig. 6. Plebeius argus var. bellieri.

Fig. 7. Plebeius sareptensis.

Fig. 8. Plebeius melissa.

Fig. 9. Plebeius micrargus, a form found in this species, but not seen in any other, the majority of the scales are much more like those of melissa.

I add rough outline sketches of the androconia to show both the general form in each species, but also to show how much they vary in each species. These sketches are approximately to scale (about \times 400). Their individual errors as to form and size are well within the limits of variation in the several species. Fig. 1 shows the usual form in ligurica from Switzerland, with which the Cernobbio type form agrees. But one Swiss specimen has most of the scales of the form in fig. 2, which is beyond the average form in argus and approaches micrargus. Fig. 3 is an average argus, with which nearly all Swiss specimens agree, as well as armoricana and the Pyrenean form. Five specimens from Val Veni agree very closely, but one specimen has most of the scales, as in fig. 4, again approaching fig. 2 and fig. 9. Fig. 5, var. nivea, 9 ribs, and fig. 6, var. bellieri, 10 ribs, are very close to fig. 3, but with a trace of tendency to figs. 2 and 6. Figs. 7, 8, and 9, sareptensis, 13 ribs, melissa, 14 ribs, and micrargus, 12 ribs, seem sufficiently different, but my series is too short to allow me to assert this positively. As regards micrargus, the androconia show a range of variation that strongly supports the view that little material can be found in them for specific definition. The scale sketched is of a form numerous in the specimen from which it is taken, and I have seen no such scale on any other form, but the same specimen presents scales such as are more characteristic of each of the other species dealt with, argus, ligurica, sareptensis, and melissa.

EXPLANATION OF PLATES.

Plate I. Male appendages of Plebeius argus (argyrognomon). Fig. 1, \times 30. Fig. 2, \times 45. Fig. 3, End of Clasp, \times 90. The specimen was from Cettinje.

Plate II. Three specimens of appendages of Plebeius ligurica (aegus), × 30.

Plate III. Figs. 7 and 8, Plebeius melissa, and fig. 9, P. micrargus, × 30.

Plate IV. Appendages of *Plebeius sareptensis*, fig. 10, \times 30. fig. 11, \times 45. fig. 12, End of Claspers, \times 90.

Plate V. Androconia, × 250. fig. 13, P. argus var. armoricana. fig. 14, Plebeius

ligurica.

Plate VI. Undersides, × 4½. fig. 15, argus var. armoricana. fig. 16, argus (from Lautaret). fig. 17, P. ligurica (aegus).

(To be continued.)

Some Notes on a Paper by Dr. Leach on Ants and Gnats in 1825. By H. DONISTHORPE, F.Z.S., F.E.S.

My friend Mr. F. D. Morice called my attention to a paper by Dr. Leach, "Descriptions of Thirteen" Species of Formica and Three Species of Culex, found in the environs of Nice," [Zool. Journ., 2, 289-93 (1825)], and asked me if I knew whether Leach's types were in the National Collection. Having obtained the volume of the Zoological Journal in question, I find that the species described are as under. Opposite each of Leach's names I give the identification of it suggested by v. Dalla Torre [Cat. Hym., 7 (1893)]. The notes of exclamation signify that v. Dalla Torre was unable to ascertain to what species the insects in question really belonged.

LEACH.

v. Dalla Torre.

- 1. Formica rubescens (Fourmis Polyergus rufescens Latr. (1798). roussâtre Huber).
- 2. Formica bicolor. .
- 3. Formica testaceipes.
- 4. Formica fusca.
- 5. Formica affinis.
- 6. Formica castanipes.
- 7. Formica Huberiana.
- 8. Formica Nicaeensis.
- 9. Formica haematocephala.
- 9. Formica rupestris.
- 10. Formica Rediana.
- 11. Formica megacephala.
- 12. Formica gigas.
- 13. Formica picea:

- " Formica bicolor Leach!" (1825).
- "Formica testaceipes Leach!"(1825).
- Tetramorium caespitum L. (1758). "Formica affinis Leach!" (1825).
- Camponotus sylvaticus Olivier (1791).
- Messor barbarus L., v. niger André (1883).
- "Formica nicaeensis Leach!" (1825).
- Cremastogaster scutellaris Olivie (1791).
- "Formica rupestris Leach!" (1825).
- "Formica rediana Leach!" (1825).

Messor barbarus L. (1767).

Camponotus cruentatus Latr. (1802).

Camponotus lateralis Ol., v. picea Leach (1825).

- 1. Culex Meridionalis.
- 2. Culex Nicaeensis.
- 3. Culex musicus.

I may mention at once that I have been unable to find a trace of

^{*} He actually describes 14 species, but he has numbered two species "9"; see above list.

any of Leach's species of ants in the Natural History Museum; and his descriptions are such that it is quite impossible to make out what the insects marked by v. Dalla Torre with a note of exclamation really are.

If v. Dalla Torre is correct as to Leach's no. 7, André's var. niger of Messor barbarus L., will sink, and will have to be known as Messor

barbarus L., var. huberianus Leach.

The most unfortunate point in nomenclature which arises is that concerning the name *Formica picea*. For over 50 years the species we now know as *F. picea* Nylander, was confused with *F. gagates* Latr., until 1909, when Emery separated it from that species on the continent (*Deutsch. Ent. Zeitschr.*, 1909, 195), and in 1912 I put the matter right for the British species [*Ent. Rec.*, 24, 306 (1912); see also *Ent.*

Rec., 25, 67-8 (1913); and Brit. Ants, 325-34 (1915)].

There cannot, however, be two species called "Formica pieca," and as Leach's name has 21 years' priority, Nylander's name must fall! This being the species described by Farren White in 1883 as Formica glabra, the latter name would have to be used; but unfortunately there is another Formica glabra Gmelin, Linné Syst. Nat., ed. 13, i. 5, 2804 (1790), which is fatal to the adoption of Farren White's name. It is also probably not ascertainable what Gmelin's species really is, but at any rate it cannot be what we know as F. pieca Nyl., since the scale is described as bidentate. The next name in order of date for this insect is Formica transkaukasica Nassonow, Imp. Obshch. Lyrrb. Est-Ant-Etn. Mosc., 58, (1) 62 [=Tr. Lab. Zool-Mus., 2, (1) 62] (1889), and this is what the insect we know as Formica pieca Nyl., will have to be called.

I have given the names of Leach's species of Culex, but must leave

this matter for our Dipterists to deal with.

The Diurni of East Tyrone.

By THOMAS GREER.

As an increasing interest is being taken in the local variation of Lepidoptera from Ireland, I have compiled the following notes on insects observed in this district.

Although the butterflies met with, only number some twenty species, the lack of quantity is to a certain extent compensated by the diverse

variation exhibited.

Pieris brassicae.—Almost entirely single brooded, although during some warm autumns, a certain number or larvæ may feed up rapidly and produce a partial second brood, the greater number remaining as pupæ and not emerging till the following year. In some seasons very abundant, in others, very rare, or almost absent.

P. rapae.—Unlike its larger relative this species is always double brooded; many of the females of the summer brood are of a pale

yellow colour.

P. napi.—This species is in this locality more abundant in damp, meadows and marshes than in woodlands; these swampy localities are always more or less under several feet of water during the winter months, hundreds of pupe of this, as well as other species being submerged, often for long periods.

In the spring brood many of the males are without the apical blotch and discal spot, while others have the blotch and spot well developed; the females are characterised by the suffusion of grey scales along the nervures, this grey scaling often spreading over the wings.

In the summer emergence the males in many instances have a second spot on the discal area and in a few specimens these spots are joined together, the markings thus approximating those of the females; a fine large form is also frequent, having strong black dashes from the discal spot to the outer edge of the wings, very similar to specimens taken by the Rev. G. Wheeler on the coast of Fife.

The females of the second brood vary from a pale primrose to a deep yellow, var. *tlava*, Kane, this latter form is however very rare; another form of the female has a distinct band parallel to the hind margin of the lower wings. The variation in size is also very marked, from

32mm. a female, to 54mm. also of the same sex.

Euchloë cardamines.—This is generally an abundant species, although last season (1917), the males were comparatively scarce, the so-called sub-species ab. turritis, Och. is also frequent, but in many cases the black central spot is well within the orange blotch, the smallest specimen noticed being 29mm. The form of the female with yellow tinged hindwings is also common, about 40 per cent. of the sex being of this aberration. A variety of the male was captured having a broad clouding of dark scales along the costa connecting the central spot with the basal area and the orange blotch much suffused with dark scales.

Dryas paphia.—Very abundant in several demesnes and also in mountain glens, which are very sparsely wooded. The form with

bleached spots on the wings occurs here.

Melitaea aurinia.—Very local, its haunts being very varied; old worked-out bogs, damp meadows, swamps, and even dry hill sides; the most abundant form here is var. praeclara, Kane. This year (1917), from a single web of the larvæ found in a small meadow of about an acre in extent, surrounded by woodland, a series of very dark forms were bred; the males approaching the var. hibernica, Birchall; the central series of blotches being of a pale lemon colour, the marginal spots very small, or absent, and the dark ground colour very intense; in others the dark colour spreads out to the red marginal spots of the forewings, almost obliterating them; the females are all very dark and the colour very vivid, otherwise they correspond with the var. scotica; a great contrast to these is, a fine large female, ab. virgata with the whole central area of wings of a bright straw colour. This nest of larvæ only produced about two per cent. of parasites. Other forms occurring here are type aurinia, Rott. very rare, and ab. artemis, Fb.

Vanessa io.—This species has been gradually increasing in numbers for the last few years, and this season it was very abundant all over the district; and a friend was fortunate in taking a fine ab. belisaria.

Pyrameis atalanta.—This species was also abundant this season, 1917.

• Pararye megera.—Abundant in both broods, the aberration with double apical occllated spots is not rare, and the size of the dark ring itself is very variable.

P. aegeria.—This species has generally three broods in a season the males of the third or autumn emergence are often very dark, only the four pale spots around the occllated spot at the apex being present, the remainder of the wing being of a dark fulvous brown.

Aphantopus (Enodia) hyperantus.—Abundant generally, the only

aberration noticed here is ab. obsoleta, Tutt.

Coenonympha tiphon.—This occurs in two widely separated districts, viz. the bogs to the South of Lough Neagh, which are only from fifty to sixty feet above sea level; and on the numerous boggy flats in the mountains at an elevation of seven hundred to one thousand feet; in the former locality, tiphon, Rott. is the almost universal form; on the other hand, on the mountains both tiphon, and the northern form laidion are found.

Callophrys rubi.—The only representative of the Hairstreaks, found in the district, is very common on the bogs at Lough Neagh; the larva feeding upon the flowers of the heath; the var. immaculata is not rare.

Polyommatus icarus.—This species has only one emergence here and is very local, being confined to sandy districts on Lough Neagh, and to light soils. The males generally are of a large size; about forty per cent. being ab. celina, Obt. and varying in colour from a pale lavender to a bright blue like Agriades thetis (bellargus) ab. clara, Tutt. The female is also a very fine insect, the following aberrations being taken,

caerulea, caerulea-cuneata, pallida, angulata, and clara.

A fine gynandrous specimen was captured in July, 1917, on the high sandy banks near the village of Coalisland; the right side being male ab. celina, left female ab. caerulea. But the most brilliant examples of all were met with on the precipitous slopes of a lonely glen in the mountains surrounded by miles of bare moorland; the males here being larger and finer than any taken on the coast-line; the ab. melanotoxa (arcuata) also occurs in this wild spot.

The Pairing Habits of certain Bees. By J. W. HESLOP HARRISON, D. Sc.

One often notices accounts in the various entomological magazines of the pairing of Lepidoptera and, more rarely, of Coleoptera, but such notes on other orders one sees but once in a lifetime; consequently Mr. Donisthorpe's article in the November *Record* on wasps, is more than usually interesting. Further, as I can supplement it by similar notes on the genus *Bombus*, the present seems a suitable

opportunity of doing so.

My first experience was with the type form of *Bombus terrestris*—a very common insect indeed on the Cleveland moors. I had been tramping for some time over the thick heather on Eston Moor collecting spiders and anything in the way of the obscurer orders of insects that was swept up or netted. Amongst the latter, the Hymenoptera formed a considerable portion of my bag in spite of the fact that the season was late September. Soon after boxing a fine *Bombus smithianus*, I caught sight of a pair of bees just rising from the herbage. All that I had perceived was that the female carried the male when they suddenly rose to a great height and vanished across the open moor.

A year later, whilst botanising in Shropshire in August, I came across a lovely nook in some rocks all overgrown with *Origanum*, and what interested me more then, a fine growth of *Ootyledon umbilicus* and *Sedum rupestre*. These occupied my attention for some time, but in

the end I got out the net to sample the insect guests of the Marjoram. Nothing very wonderful rewarded my efforts, for what I took were just what one would see any sunny day in summer in Middlesbrough Park. However, just as I was about to leave collecting bees, and to begin beating for Arachnida, I caught sight of a pair of bees in cop. which, as they rose, struck me as being excessively minute for Bombi. I therefore captured them and was amazed to find that the pairing was between species of different genera—a male of Psithyrus vestalis paired with a worker of Bombus hortorum. This is an important capture for, laying aside the fact that the insects were of different genera and species, we have two other noteworthy features: (1) a parasite or inquiline paired with its host, (2) a worker paired with a male. Both of these peculiarities appear to be of some considerable importance, and I hope to discuss the matter in full elsewhere.

Next day, I continued my botanical work, but on this occasion my labours carried me across the Radnorshire border into a little secluded valley near Knighton, where I neither took nor saw anything out of the ordinary (i.e. to one accustomed to work in the north-eastern counties) save Campanula patula which grew in considerable abundance out of the hedges and the neighbouring whins. In plucking a fine example of this plant I accidentally laid my hand upon and disturbed the mossy nest of a colony of Bombus derhamellus, which was betrayed by the angry buzz inside. Being desirous of watching the journeying to and fro of the bees, I sat down to do so, and work continued uninterruptedly in spite of my presence. Shortly after I commenced my notes, a female crawled out of the nest followed by a group of halfa-dozen males, which, after circling round for a few moments, swooped down upon her. With one of these she paired, and immediately after both crept away amongst the moss and soft grass. Having noticed where they went, I turned the grass aside to continue my observations and found them still paired, although directly afterwards the female shook the male off two or three times. He, however, recovered himself, and they settled down quietly.

The female was tightly held both by the legs and jaws of the male, the latter being buried deeply in the fur of the hinder parts of the thorax. The first pair of legs likewise grasped the thoracic fur, but the second pair were interlocked with the female's third pair thus constricting her wings at the base and forcing them upright, thereby rendering flight impossible. The third pair were tightly clasped round her abdomen. All the while the male kept his antenne briskly

vibrating.

When nothing further seemed to occur I boxed the pair, and soon

after they separated.

Of course I have not seen enough instances of pairing in the *Bombi* to generalise, but the difference in pairing habits between the burrowing *Bombus terrestris* and the surface-building *B. derhamellus* seems very significant.

OTES ON COLLECTING, Etc.

FIELD NOTES FROM BATH AND THE NEIGHBOURHOOD.—On September 1st Ennomos quercinaria occurred at Bathampton, and other specimens were seen later in the month. At Bathford a larva of Triaena (Acro-

nicta) tridens was found on grass. It had just assumed the last instar. and had doubtless been blown off the hedge above by the rough wind. It refused to touch any of the various leaves I provided it with and subsequently died. I heard of a second individual which behaved in the same way. Early this month Goneptery rhamniappeared in Victoria Park, and I took a nicely banded form of Camptogramma bilineata, the only Geometer I have set for years. From a tall hawthorn hedge. near Combe Down, a single Semasia spiniana was boxed, but I could not disturb any further specimens. It was perhaps rather late for this species. Two specimens of Eudoria (Scoparia) angustea were found at rest on tree-trunks in Victoria Park, and two others in the Institution Gardens, and I believe I beat a fifth from a hedge near Swainswick, but it flew off too rapidly to identify it. This species appeared to be quite over in a few days, as though I looked for it I saw no more. There is, just beyond the Hampton Rocks, a beautiful and rather sheltered meadow, which I did not find till this month, unfortunately, as it looks a promising spot. In one place were a number of scabious blossoms, and many of them supported Aglais urticae and a few Vanessa io. They made a brave show in the afternoon sunshine of the day I was there. From the hedge at the entrance of the field I took a grey Cerostoma vittella and disturbed a specimen of Chelaria huebnerella. Though birch is no doubt the favourite food-plant of this species. I fancy it may also 'eat hazel, as I have beaten it out of this far away from any birches. On another occasion near the Rocks above mentioned, Rhacodia caudana, a pale form, was netted, and a couple of Peronea sponsana were tapped out of beech. This species occurs sparingly in all the beech clumps here where I have tried for it. ally flies to the ground, and sometimes shuffles away like a Depressaria. I have seen none of the pale form. At Conkwell, in a wood, the only specimen seen of P. schalleriana was taken. It is no doubt common there as there are sallows, but the weather was against visiting the wood at the right time. The 8th of the month might be described as a "copper" letter day, as I then saw the only Rumicia phlaeas of the whole year. It is strange that I have seen no other individual of this usually common butterfly. This event occurred at Bathford, where I also saw a fully grown larva of Macrothylacia rubi enjoying a leaf of clover. On the 14th I went through the lane to Swainswick, took a Eucosma lacunana and saw two other specimens, but these were worn, Barrett mentions a second flight of this abundant species in September. The next day the wood below the Hampton Rocks yielded, in response to beating, P. sponsana, Argyresthia semitestacella, and the larva of Dasychira pudibunda from beech, while from hazel came two larvæ of Demas coryli. On the 19th a fresh male of the beautiful Himera pennaria was seen at rest in Victoria Park, and also two fully grown larvæ of Acronicta megacephala. Three days later I searched two or three sallows which grow along the canal near Limpley Stoke, but only saw one larva of Notodonta ziczac. On the beech trunks a few Hadena protea were partly hidden among the moss and lichen. This species was quite common about this time, but all of them were of the grey form, one seen at Bathampton was handsomely marked with black. Much to my surprise I found a Pandemis heparana female in Victoria Park on the 24th. I had not seen this species since August 4th, Scopelosoma satellitia, of a dark brown form, occurred at Midford, and

one specimen of Catocala nupta was seen at rest in the town on an electric metal standard about four feet from the ground. The 29th was very fine. In a little garden near Bath Easton Pyrameis atalanta and Aglais urticae were feeding on the asters, and two Simaethis were flitting about round an apple tree, but when boxed they proved to be only S. fabriciana. Lyonetia clerkella had been mining the leaves of the same apple. The great feature of September here was the abundance and variety of Teras contaminana. It would not I think be an exaggeration to say that in some hedges there were half a dozen individuals to every square yard of foliage.—Alfred Sich. October 27th, 1917.

Further Notes from Netley, Hants.—August 5th.—Lophopteryx camelina, Luperina caespitis, Cosymbia (Ephyra) pendularia and Selenia

tetralunaria occurred at light.

August 6th.—Bithys quercus was noted. Miltochrista miniata came to light and a full fed larva of Pheosia (Notodonta) dromedarius was

found.

August 9th.—On a small portion of the heath which had been burnt, Phycis fusca (carbonariella) and Hipparchia semele were abundant. Vanessa io was just coming out. Aglais urticae were met with but very small. Polyommatus icarus, Epinephele tithonus and E. jurtina were now common, and several Pararge megera were obtained. Anaitis plagiata was common on fences. A full fed larva of Acronicta leporina was found, and several small larvæ of Phalera bucephala.

August 11th.—At sugar Amphipyra pyramidea 4, Mania maura 1, Thyatira batis 3, Amphipyra tragopogonis 1, Calymnia trapezina 1, and Apamea secalis (oculea) 1. A larva of Eumorpha elpenor was found on

vine.

August 18th.—The first specimen noticed of Noctua wanthographa

came to light with N. c-nigrum.

August 19th.—Two full fed larvæ of Cossus ligniperda were met with, and a cocoon of Orgyia antiqua was first seen. Luperina testacea 1, Selenia bilunaria (illunaria) 1, and Porthesia similis (auriflua) came to light.

August 21st.—Sugar attracted Amphipyra pyramidea 7, Catocala

nupta 1, and Thyatira batis 1. Spilodes verticalis came to light.

August 22nd.—At light Lygris testata and Hydroecia nictitans.

August 24th.—Sugar attracted Thyatira batis 2, Calymnia trapezina,
Mania maura, Noctua xanthographa, and Hydroecia nictitans all three
singly. At light several Orneodes hexadactyla (polydactyla), Crocallis

elinguaria 1, and Amphipyra tragopogonis 1, were taken.

August 25th.—Pieris brassicae larvæ were common but very small.

P. rapae larvæ were also common but many were half grown.

August 26th.—At light Luperina caespitis.

August 30th.—Pararge megera several, Pieris rapae, P. napi, Aglais urticae 1, and Vanessa io 3, were obtained.

September 1st.—Sugar produced Amphipyra pyramidea 8, Asphalia

diluta 1, T. batis 1, Noctua c-nigrum 1, and N. wanthographa 1.

September 6th.—Dysstroma (Cidaria) citrata (immanata), Crambus geniculeus, Gonepteryx rhamni, and Coenonympha pamphilus were met with.

September 10th.—Neuronia popularis and Luperina caespitis came to light.

September 12th.—One Colias edusa was seen.

September 15th.—Ennomos alniaria (tiliaria), Timandra amata, Plusia gamma and Luperina testacea came to light.

September 23rd.—A full fed Pharetra (Acronicta) rumicis larva was

found.

September 25th.—One specimen of Hyloicus (Sphinx) pinastri was taken.

September 26th.—One Agrius convolvuli was taken. Pyrameis atalanta was quite fresh out. The larvæ of Mamestra persicuriae both small and full fed were common.

September 27th.—Rumicia phlaeas was very common. The larvæ

of Mamestra (Hadena) oleracea were first noticed.

September 28th.—*Timandra amata* was taken, and larvæ of *Dasychira* pudibunda, *Hylophila prasinana*, and *Diurnea fayella*, were met with.

October 2nd.—A full fed larva of Drepana falcataria was taken.

October 5th.—One Agriopis aprilina was taken. A pupa of Gonoptera libatria was found spun up in a folded birch leaf. (It has since emerged.)

October 10th.—Pyrameis cardui 1 was taken. October 15th.—Chesias spartiata came to light.

October 17th .-- Himera pennaria 2 males came to light.

October 25th.—Several Epirrita (Oporabia) dilutata were obtained.
—G. S. Robertson, M.D., "St. Annes.," Thurlow Park Road, S.E. 21.

Papilio bianor in England.—Mr. Bedford's note on this subject (vol. xxix., p. 184 of the *Entom. Record*) has interested me very much because I have had during the past season a considerable number of *Papilio bianor* in my possession in all stages. Several of the newly emerged butterflies were given their liberty in my garden in order that I might observe their habits and mode of flight, and that I might see whether they would be attacked by birds; and it is quite possible that some of my escapes might have reached Lewes. I imagine, however, that the real centre of distribution is Bagshot, where Mr. Cecil Floersheim has been breeding this species in very large numbers in his butterfly house. Many of his butterflies have, I know, been allowed to escape. My stock was kindly presented to me by Mr. Floersheim who also, I believe, supplied the Zoological gardens. I think there can be no doubt that the "exotic *Papilio*" referred to by Mr. Ashby (vol. xxix., p. 171) will prove to be referable to this species. The place of its capture is scarcely a mile away from Mr. Floersheim's garden.

There is, I think, little room for doubt-that *P. bianor* could easily be acclimatized in this country if its foodplants—*Skimmia* and other species of *Aurantiaceae*—were more widely cultivated. Mr. Floersheim tells me that a small colony have already established themselves naturally in a large and well stocked garden some 20 miles away from his house, that is to say the colony is the progeny of butterflies, escaped from his garden during the last few years, which have discovered the *Skimmia* plantation in the distant garden and oviposited on them. My experience suggests that it is a hardy species, little given to disease or liable to parasites, and that it feeds up and completes its metamorphosis

with a vigour which leaves little to be desired.

The adult larva, with its anterior swelling and eye-spots reminiscent of Eumorpha elpenor, with its oval turquoise markings so suggestive of the patterns of certain lizards and its general "snaky" appearance and attitudes, is a most interesting creature. I was surprised to find that the full-grown larva can extend its whole length horizontally from the edge of a leaf supporting itself entirely by the last two pairs of claspers

-a feat which intensifies wonderfully the general suggestion of

"snakiness" which no naturalist could fail to recognise.

The pupa when attached to the denuded twigs of *Skimmia* in a seminatural state is practically always of a vivid green which harmonises well with the underside of a leaf. Some pupe, in one of my cages which is only lighted by a panel of perforated zinc, were of the bright green colour referred to, for some weeks after pupation, but they have now become much more mottled. In this house too I have found the only pupa I have seen of this species which is of the dull brownish-buff form with which we are all familiar in *Papilio machaon*.—J. A. Simes, (F.E.S.), Greenacres, Woodside Rd, Woodford Green.

AGRIADES CORIDON VAR. SYNGRAPHA.—There appear to have been captured in the Chiltern Hills an extraordinary number of the syngrapha form of A. coridon. In fact one must almost look upon the form which has hitherto been only met with as a really rare aberration of quite sporadic occurrence as being a local race in that area.—

H.J.T.

COURRENT NOTES AND SHORT NOTICES.

Conte Emilio Turati has published a description of a new species of Anerastiinae, taken at Tivoli, near Rome, under the name of Emmalocera palaearctella. It is closely related to E. leucopleurella, described by Ragonot in the "Memoires sur les Lépidoptères" (Romanoff). He gives a plate of figures of structure, the neuration of fore- and hindwings, the androconial tuft which is placed between the median and posterior legs below the fore-wings of the male, the genital armature of the male, the curiously elbowed antennae of the male, the antennae of the female, etc. At considerable length he discusses the genus Emmalocera established by Ragonot, and the two species it comprises with regard to their structural likeness to various species in other genera, including the imperfectly known species Biafra rhodiniella. E. leucopleurella was taken at Accra, in West Africa.

Another of the old time lovers of Nature has passed away in Arthur C. Vine of Brighton, a member of the S. London Society since 1889. Although he was unknown as an attendant at the meetings, some of the older members who worked the Downs in the neighbourhood of Brighton knew him as a valued correspondent, ever ready to help them

in aught entomological they had in hand.

The Vasculum, the north of England quarterly, for which our colleague Mr. Richard S. Bagnall and his friend Dr. J. W. H. Harrison are largely responsible, has now reached its third year of publication and the June and September parts lie before us. In the former our colleague has begun a series of articles entitled "Primitive-tails, Bristle-tails, and Springtails" dealing with the three most primitive orders of the class Insecta-Arthropoda often termed "Apterous Insects," viz., the Protura, the Thysanura, and the Collembola. These will be of the utmost use to many naturalists, as there exists no literature sufficiently elementary to aid the ordinary lover of nature in getting details of these orders. In the September number, Mr. Bagnall quotes from the article he sent to "Knowledge" in 1912 giving an account of his discovery of insects of the order Protura in England for the first time. He first found the species in 1909 and perceived at once that it was a quite new type of

insect. On sending details and sketches to Prof. Silvestri he found that the three species he had met with belonged to the order *l'rotura* established by the Professor in 1907. Much of the other matter is of more or less local interest. Small illustrations are inserted wherever

necessary to aid the text.

In the December number is an interesting article on "Eyeless Migrants," by Mr. J. E. Hull. It deals with the mites such as one finds clinging to the bodies of beetles and other insects. He states that these mites, Gamasids, "are not parasites, but merely passengers. The food problem is the chief reason for the connection between the beetle and the mite." Mr. J. W. H. Harrison describes the famous collecting ground, Birtley Fell, co. Durham, and its insect fauna. There is also a summary of the immigration of Agrius convolvuli in 1917; a considerable number of specimens were met with in the Northern Counties of England, and one has been reported even from the Shetlands. Altogether this is a very useful quarterly. We congratulate the Editors on their venture.

A small book has been sent for review entitled "Plant Material of Decorative Gardening: The Woody Plants." It consists of a very full Analysis of "trees, shrubs, undershrubs and climbers" met with both wild and under cultivation in N. America. The whole is an elaborate scheme of Keys of Groups, Genera and Species with a useful Synopsis of Terms. Its claim upon our pages may be instanced by the following extract from the introductory matter. "An entomologist comes to me with a branch of a tree badly infested with scale insects. The Synopsis of Groups leads me to Group A. It is obviously deciduous, not at all prickly or spiny, with rounded twigs, opposite leaves that are rather large, pinnately compound with five or seven somewhat toothed shortstalked leaflets green on both sides. Through Key A, I go by successive steps to 112. Here I cut the twig cleanly across midway between two nodes and find that the pith is of moderate diameter as compared with elder pith; the succeeding steps lead on to 114 where I find that the scars from which last year's leaves have fallen are squared off below this year's twigs or any undeveloped buds of last season, so that I am convinced that it is a Fraxinus. In the key to the species of ash I go successively through to 14 where I find it to be Fraxinus lanceolata." As the work deals with a large number of garden varieties of shrubs and trees it will no doubt be of considerable use in identifying the foodplant of many a troublesome garden pest and thus help in the investigation of life-histories by the economic entomologist.

In the *Entomologist* for October, Mr. W. G. Sheldon attacks a problem which many have attempted but failed to accomplish, that is to work out the real life-history of that most variable of the Tortrices, *Peronea cristana*. In the first portion the writer deals with the species historically and then describes the ovum, and the larva in its various

instars.

In the death of Mr. W. West, of Sutton, the South London Entomological Society loses one of its oldest members. He joined the "Club," as it was then familiarly called, in 1878, and for the whole forty years had kept up active work in it, being on the Council at the time of his death. He was in the chair in 1884.

time of his death. He was in the chair in 1884.

Another old member of the South London Entomological Society has just passed away in the death of Mr. W. T. Manger, of New Cross.

He joined the Society in 1886, and until the commencement of his lingering illness, some years ago, took an active interest for many years

in both the indoor and outdoor meetings.

The South-Eastern Naturalist, the annual transactions of the South-Eastern Union of Scientific Societies, has recently come to hand. It contains a full account of the Congress held in June last at Burlington House. There is no natural history in the transactions except in a very broad way. Probably the most interesting to a naturalist is the paper by Prof. E. W. McBride, F.R.S., entitled, "Are Acquired Characters Inherited?," a question which he answers in the affirmative. portion of this paper discussed the experiments of Kammerer with the European salamanders, Salamandra maculosa and S. atra, the results of which if reliable (some authorities strongly doubt the evidence) give much support to the view. There is a very strong Botanical Section in the Union, and a report of their work, etc., during the year occupies some ten pages. Let us hope that in the near future there may also be a Zoological Section; there are we see by the list of members a good number of zoologists in the Union who might advantageously unite as the botanists have done, and form a similar section. There is only one plate this year.

The first part of the Trans. Ent. Soc. London for 1917 was issued in November. It contains the papers read between December, 1916, and March, 1917, with the Proceedings of the meetings held from January to June. There are fourteen plates, of which six are coloured, and numerous diagrams. There are eight papers, of which five are systemic, the remainder being "On the Protocerebrum of Micropteryx," by P. A. Buxton, B.A., F.E.S., "Some Notes on Butterfly Migrations in British Guiana," by C. B. Williams, M.A., F.E.S., and "The condition of the Scales in the Leaden Males of Ayriades thetis, and in other Lycanids," by E. A. Cockayne, M.D., F.E.S. The Proceedings contain some interesting notes, "Lepidoptera from Salonika," "Notes on Pediculus species," "Some S. Indian Hemiptera," "The ovipositors of three Siricids, Paururus juvencus, noctilio, and cyaneus," with a plate, "Morpho adonis and M. eugenia distinct species," and many useful short

items of new information.

We have just heard that Mr. Harwood (Colchester) passed away at the end of December. He was one of those who held a good name as being most reliable in all his business transactions with lovers of nature. He had some literary attainments and was the author of

numerous poetical pieces.

In the Canadian Entomologist for October, Prof. Skinner calls attention to the "confusion in the knowledge and determination of the American species of the genus Aryynnis" to which his attention was called by a letter from M. Oberthur. He points out that this confusion has largely arisen from the "lack of data," "loss of types," "absence of fixed types," "plastic or variable forms," etc., and he suggests first the fixing of a single form as a type, and secondly the delimitation of the range of variation of each. "To do this, large series must be studied, and they should have exact locality, date of capture and altitude where taken. He illustrates his remarks by reference to the works of various authors, American and European, who have worked at this genus.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.

October 3rd, 1917.—Election of a Fellow.—Dr. George Granville Buckley, M.D., F.S.A., Holly Bank, Manchester Road, Stafford, was elected a Fellow of the Society.

DEATH OF AN HONORARY FELLOW.—The death of Dr. Emil Frey-

Gessner was announced.

COLEOPTERA ON UNUSUAL FOOD-PLANTS, ETC.—Mr. Donisthorpe exhibited the following Coleoptera:—

1. Miarus campanulae, L., taken on the downs at Findon (Sussex), June 14th, 1917, in some numbers, in a small species of buttercup only.

2. Lycoperdina succincta, L., taken at Barton Mills (Suffolk), Sep-

tember 9th, 1917, in fungus.

3. Cassida fastuosa, Schal., taken at Goring Woods (Sussex), July 28th, 1917, on Inula dysenterica. This is its first record on Fleabane; and all the specimens were of a bright yellow and black colour when alive, and not as is usual red and black.

Photographs of Sawely Larvæ.—The Rev. F. D. Morice exhibited with the epidiascope a set of photographs (mostly taken from living specimens feeding or resting on their usual food-plants) of several saw-

fly larvæ.

Paper.—The following paper was read:—

"Further notes on Recapitulatory Attitudes in Lepidoptera," by T. A. Chapman, M.D., F.Z.S.

October 17th.—Election of Fellows.—Mr. John Williams Hockin, Castle Street, Launceston, Cornwall; Col. Turenne Jermyn, Highcliffe, Weston-super-Mare; Mr. Arthur Wallace Pickard-Cambridge, M.A., Balliol College, Oxford; and the Rev. Prebendary A. P. Wickham, East Brent Vicarage, Highbridge, Somerset, were elected Fellows of

the Society.

Hyper-parasites on Apanteles glomeratus.—Mr. Donisthorpe exhibited a number of small yellow cocoons which were taken on a fence at Putney on September 15th last, and which had emerged from the body of a White Butterfly larva. On October 8th Hymenopterous insects began to emerge from the cocoons and were still doing so; of the specimens exhibited, some of which were alive, 23 belonged to the insect captured on September 15th, and two (a 3 and 2) to another species of Hymenoptera. It would seem these belonged to a hyperparasite, parasitic on the original parasites.

A NEW SUB-SPECIES OF MORPHO RHETENOR.—Mr. Dicksee exhibited a probable new sub-species of Morpho rhetenor, now received for the first

time from Colombia.

An aberrant Wasp.—Dr. Chapman exhibited an aberrant specimen

of a wasp (Vespa germanica) and made observations upon it.

A VERY RARE BRITISH BEETLE.—Mr. O. E. Janson exhibited a fine example of *Tapinotus sellatus*, Fab., taken by him on June 9th last near Horning, Norfolk. Only two British specimens were previously known. He also showed some other Coleoptera of interest taken in the same locality.

A British specimen of Notodonta bicoloria.—Mr. O. E. Janson also exhibited on behalf of Mr. L. H. Bonaparte-Wyse, who was present as a visitor, a fine male specimen of *Notodonta bicoloria*, Shiff., taken

by him near Killarney on June 7th last.

LIVING DERMESTID LARVÆ.-Mr. Green exhibited living larvæ of a Dermestid beetle, Tiresias serra, found under dead bark of an oak tree, in the neighbourhood of Shrewsbury.

Mr. Green also read a valuable note on the oviposition of the saw-

fly Pteronus sertifer.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

September 13th.—Breeding of C. campestris.—Mr. Hugh Main exhibited an observation cage with the burrow of Cicindela campestris, containing the already perfected imago, which would, however, not emerge from the "dug-out" till the spring. He also showed a Mantid from Sicily, which readily took larvæ and flies when offered to it, and he reported the large green grasshopper Locusta viridissima as feeding

readily on larvæ of Pieris brassicae when offered to it.

ABERRATIONS OF C. PAMPHILUS.—Mr. Leeds, a number of aberrations of Coenonympha pamphilus from Herts, including upperside specimens with absence and variations in size of the apical spot of forewing, variations in amount and depth of marginal shading of all the wings, ab. lyllus, several specimens with straw-coloured areas, ab. pallida, an additional spot on forewings, apical spots having small white centre, two spots on the hindwings, straw-coloured striations between nervures, and underside specimens, having small ocelli, very dark ground, ocelli with emphasised straw circles, the ocelli doubled, small additional black spots attached to the ocelli, with extra ocelli, and asymmetrically marked examples.

ABNORMAL UNION.—Mr. Turner reported that Dr. Chapman had carefully examined the trio of Hyponomeuta euonymella previously exhibited, and found that the second male was firmly attached to one of

the abdominal segments of the first male by the claspers.

EXHIBIT OF THE GENUS GEOTRUPES.—Mr. Ashdown, the Coleopteron Geotrupes pyrenaeus from Oxshott, with other species of the genus.

Bryophila perla and B. Glandifera.—Mr. Barnett, a long varied series of Bryophila perla, including yellow, generally dark, and strongly marked examples, and a short series of B. muralis, both from Bognor.

P. MACHAON AT DOVER.—Mr. Pearson, a battered specimen of Papilio

machaon recently captured at Dover.

Varied series of British Lepidoptera.—Mr. Sperring, long varied series of Polyommatus icarus from Portsmouth, dark Spilosoma lubricipeda with hindwings as dark as the forewings, a rich yellow Pieris napi from Donegal second brood, and a plum-coloured Aglais urticae.

REPORTS ON THE SEASON.—Reports were made as to Colias edusa, Agrius convolvuli, Plusia gamma, parasites and Pieris brassicae larvæ,

and ants occurring with Agriades coridon.

September 27th.—P. MACHAON.—Mr. Moore exhibited Papilio machaon

from Bayenghem, Pas de Calais.

ABERRATIONS OF BRITISH LEPIDOPTERA.—Mr. Barnett, bred series of Ochyria ferrugata and Venilia maculata, and aberrations of Polyommatus icarus.

Cocoons of Cydia pomonella.—Mr. West (Greenwich), specimens of the cocoons with pupe of Cydia pomonella formed in a rug of varied colours placed near stored apples.

A. TANACETI.—Mr. Blair, living Adimonia tanaceti from the I. of Man.

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Duplicates.—East African butterflies wanted, butterflies of any country except species occurring in Britain.—W. Feather, Kibwezi British East Africa.

Desiderata.—Pieris napi—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; Pararge ægeria from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—G. T. Bethune-Baker, 19, Clarendon Road, Edgbaston.

Duplicates.—Machaon*, Sinapis, Edusa, Hyale, Valezina, Artemis*, Cinxia, Athalia, G-album*, Polychloros*, Sibylla*, Cassiope, Blandina, Davus, Betulæ*, Artaxerxes, Arion, Actæon, Galii*, Seoliæformis*, Minos, Exulans, Meliloti, Albulalis, Helveola*, Quadra*, Cribrum, Hera*, Fuliginosa*, Fascelina*, Cratægi*, Callunæ*, Trifolii*, Versicolor*, Lapponaria*, Hispudaria, Glabraria*, Abietaria*, Obfuscata, Trepidaria*, Smaragdaria*, Orbicularia*, Auroria, Fumata, Pictaria*, Alternata*, Carbonaria, Pinetaria, Cæsiata, Ruficinctata, Salicata, Pygmæata*, Togata*, Sexalisata, Munitata, Fluviata, Lapidata*, Undulata, Reticulata, Nubeculosa*, Chaonia*, Or, Flavicornis var. Scotica*, Ridens*, Leporina, Menyanthidis, Myricæ, Concolor, Templi, Agathina*, Conspersa, Barrettii, Occulata*, Tineta*, Glauca, Rectilinea, Peltigera, Melanopa, Cordigera, Interrogationis, Bractea, Craccæ, etc. Desiderata.—Varieties and local forms.—Arthur Horne, Bonn-nd-Coille, Mürtle, Aberdeenshire.

Wanted, for research purposes, during 1917, ova and larvæ of almost any species of British Lepidoptera. Offered British beetles (many scarce or local) and microscopic mounts.—Geo. B. Walsh, 166, Bede Burn Road, Jarrow-on-Tyne.

Note.—Mr. Donisthorpe will be grateful for any ants from all parts of the British Isles, with localities, unset or otherwise, for the purposes of study.—H. St. J. K. Donisthorpe, 19, Hazlewell Road, Putney, S.W.

I would be very glad to exchange Californian butterflies for English blues especially the variable ?s, and the blue ?s of coridon such as have been recorded by Keynes and others.—Fordyce Grinnell, Jr., 712, East Orange Grove, Paradena, California, U.S.A.

Duplicates.—Artemis* (Cornish), Tithonus extra spotted vars., Corydon var. Semi Syngrapha (fair only), Tiliœ*, Angularia* (Quercinaria), fine banded vars., Bicuspis* and many others, also Pupæ Lacertula, Falcula, Tiliæ, Consortariā, Versicolor, etc. Desiderata.—Perfect only Cardamines & s, Cardui, Iris, Ocellatus, B. quercus, Chlorana, Ligniperda, Humuli, Convolvuli, and many others. Also Pupæ Carpini, Porcellus, Callunæ, Dictæa, Dictæoides, Dodonea, Vinula, S. ligustri, and many others. Liberal exchange or cash.—L. W. Newman, Bexley, Kent.

Desiderata.—Euchloë cardamines from Ireland; also types of E. cardamines from Switzerland, Italy, S. France; var, turritis (S. Italy), var. volgensis, var. thibetana, and of E. gruneri, F. euphenoides, E. damone, and any palearctic species of the genus. Duplicates.—Loweia dorilis and vars., a few minor vars. of R. phlæas (British), and many British lepidoptera.—Harold B. Williams, \$2, Filey Avenue, Stoke Newington, N.

Duplicates.—Ova: Cervinaria, Neustria. Larvæ: Ornata, 5 Falcula, 5 Lacertula, Caja; Pupæ Persicaria, 6 Populi. Imagines: Adonis, Corydon, Irish Napii, H. comma, Tages, Malvæ, Sylvanus, 2 Tipuliformis, 8 Cynipiformis, 1 Culiciformis, 2 Bembeciformis (fair only), 6 B. quercâs, 9 Carpini, Humuli ?, 13 Hirtaria, 7 Macilenta, 1 Papilionaria, Ornata, Gilvaria, 2 Crepuscularia, cervinaria, 4 Punctularia, 3 Palumbaria, 2 Falcula, Lunosa, Vaccinii, Spadicea, 4 Lutulenta, Crudæ, Stabilis, Gothica, 6 Instabilis, Rumicis. Desiderata.—Very numerous, pupæ and imagines.—F. T. Grant, 37, Old Road W., Gravesend.

Duplicates.—Cardamines ? ? s, Brassicæ, Rhamni, Euphrosyne, Selene, Aglaia, Adippe, Io,* Galatea, Egeria, Hyperantus, Ianira, Semele, Megera, Iarus, Bellargus, Argiolus, Lucina, Quercus, Rubi, Malvæ, Tages, Sylvanus, Comma, Filipendulæ, Trifolii, Jacobææ,* Mendica,* Russula & s, Caia*, Auriflua,* Falcula, Neustria,* Pavonia,* Flavicornis, Duplaris, Pallens, Arcuosa, Rumicis, Graminis, Gemina, Comes,* Xanthographa,* Secalis, Pisi,* Piniperda, Gothica, Cruda, Baia, Meticulosa, Rufina, Brassicæ,* Litura, Satellitia, Oxyacanthæ var. Capucina, Vaccinii, Lithargyria,* Incerta, Pistacina, Fulvago, Triangulum, Trapezina, Mi, Glyphica, Myrtilli, Parthenias, Maura,* Maculata, Advenaria (very fair), Autumnaria,* Abruptaria, Pilosaria,* Hirtaria,* Obscurata, Biundularia, Consortaria, Consonaria,* Punctulata, Pendularia,* Belgiaria, Gilvaria, Adustata,* Clathrata, Pulveraria,* Pusaria,* Pictaria, Albulata, Multistrigaria, Fluctuata, Ocellata, Montanata, Procellata, Albicillata, Bicolorata, Badiata, Aurantiaria, Marginata, Boreata, Dilutata, Leucophearia, Carpinata, Impluviata, Juniperata, Rufata,* Mensuraria, Firmata,* Obeliscata, Pyraliata. Black pins and full data. Pupæ of Jacobææ and Hispidaria. Desiderata.—Local species and local forms of British Macro-Lepidoptera, particularly northern.—A. W. Buckstone, 307a, Kingston Road, Merton Park, London, S.W. 19.

MESOPOTAMIA.—I should be glad of information on insects or news of other entomologists in this country.—P. A. Buxton, Fairhill. Tonbridge.

Change of Address.—J. A. Simes, F.E.S., Greenacres, Woodside Road, Woodford Green.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1918, Jan. 16th, Annual Meeting.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—Meetings: The second and fourth Thursdays in the month at 7 o'clock. January 24th, Annual Meeting—Hon. Sec., Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. Hon. Sec., J. Ross, 18, Queens Grove Road, Chingford, N.E.

Toynbee Natural History Society.—Toynbee Hall, at 8 p.m. Entrance fee ls., annual subscription ls. *Meetings*: Full particulars as to excursions can be obtained from the Excursion Secretary, Miss L. Roberts, 11, St. James, Hatcham, S.E. Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in each month from October to April.—Hon. Sec., Wm. Mansbridge, 4, Norwich Road, Wavertree, Liverpool.

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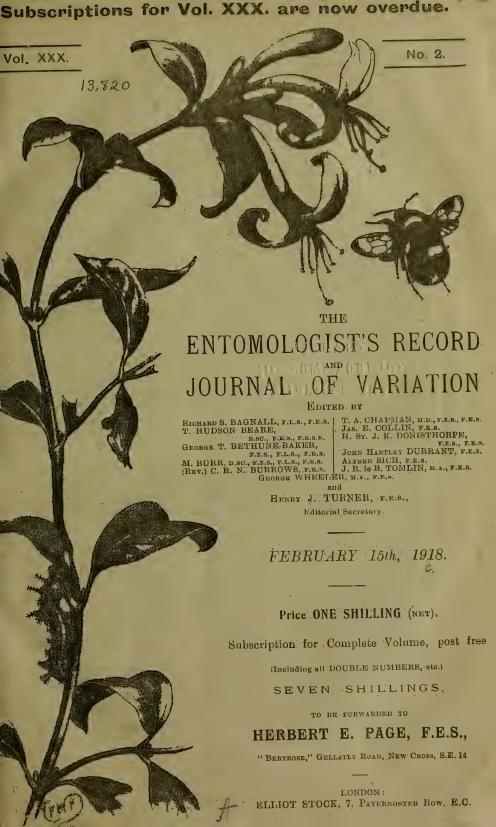
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Myrmecophilous Notes for 1917.

By H. DONISTHORPE, F.Z.S., F.E.S.

This year I have not much to report from ants' nests in nature. I spent two months in the summer at West Worthing, and it did not appear to be a good locality for ants—indeed the only species noticed in the Worthing district were Myrmecina graminicola Latr., Myrmica laevinodis Nyl., and its var. ruginodo-laevinodis Forel, M. scabrinodis Nyl., Acanthomyops (Donisthorpea) niger L., A. (D.) alienus Först., A. (Chthonolasius) flavus F., and Formica fusca L. Myrmecophiles were also very scarce, the only species found being, the beetle Drusilla canaliculata L., the spiders Harpactes hombergi Sep., and Micaria pulicaria Sund., and the wood-louse Platyarthrus hoffmanseggi Brdt., all taken with A. (D.) niger at West Worthing.

When at Barton Mills, in September, very few ants were seen; A. (Dendrolasius) fuliginosus Latr., was scattered all over the district, its nest, however, not being found. A large colony of A. (C.) umbratus Nyl., occurred at the roots of a fir stump; the only creature observed in company with the ants being a single Micaria pulicaria Sund. A. (D.) alienus Först., was common in rabbits' burrows, etc., Othius

myrmecophilus Kies., occurring with it.

Myrmicinæ.

Myrmecina graminicola Latr.—This species was not uncommon in moss on the Downs at Findon in June; being also found in company

with Myrmica scabrinodis in the same locality.

For the third year winged females have been bred in my colony of this ant, which I have now kept in an observation nest for over seven years [see Brit. Ants, p. 81; Ent. Rec., 28, 1 (1916), 29, 30 (1917)]. On April 8th a ? pupa was present, and by May 18th J, ?, and \$ pupæ were in plenty. June 2nd, the first winged ? hatched; June 13th, 5 winged \mathfrak{P} \mathfrak{P} present, and the first \mathfrak{F} put in an appearance; by June 23rd over 20 of both \mathfrak{F} \mathfrak{F} and winged \mathfrak{P} \mathfrak{P} present; October 13th, only 1 winged ♀ to be seen, and all ♂ ♂ had died off. ? ? removed their wings as before and proceeded to act as \ \delta, but copulation was not noticed this year though it probably took place when I was not there to see. The colony had again been well supplied with animal food throughout the year. To-day (December 31st) there are present a very large number of medium sized larvæ, and the numerous & and dealated & are resting on them. I am unable, however, to detect any egg clusters.

As will presently be seen, I have also bred winged of Leptothorax nylanderi in my observation nest containing a colony of that species. It is perhaps as well again to call attention to the fact that, in spite of the numerous myrmecologists who have kept ants in observation nests for the last 100 years, winged females have only once been bred from eggs laid in captivity (when, in 1880, Lord Avebury had five queens developed in one of his F. fusca nests) until 1915, when such females were first produced in my Myrmecina colony.

Ants do not rear the winged forms until the colony has reached a certain strength, and sufficient workers have been produced; then given abundant and suitable food, they will bring up the sexes. Having

February 15th, 1918.

reached this stage, the ants are able to bring up the sexes (males may also be produced under certain circumstances from parthenogenetic eggs); and judging from my experiments I do not believe that the queen lays eggs which must become females, but that the workers

bring this about by extra feeding of their larvæ.

A marriage flight of this variety was observed at Richmond Park at 1.30 p.m. on August 21st. One couple was joined together on the ground, and many 33 and a few 99 were running about and rising

into the air.

The var. ruginodo-laevinodis also occurs at Putney, as I have

captured \(\preceq \) on a fence in a road near my house.

Leptothorax nylanderi Först.—I have had a colony of this species in my possession since 1912 [see Brit. Ants., 159-60 (1915); Ent. Rec., 28, 2 (1916), and as stated above winged females were developed in it this year. March 18th, & and & pupe present; May 24th, first & shed their wings, I marked the old queen by clipping off a bit of the right intermediate tarsus; June 17th, over 30 winged ? ? and over 50 3 present; June 21st, the winged sexes were evidently desirous of taking their marriage flight, hurrying about all over the nest, and on the glass roof, and trying to fly as well as they could in the confined space. The & & were also very excited and running about in every direction; only the old queen remained quietly resting on the larvæ and pupæ. The 3 3 were not seen to pay any attention to the females, and copulation was not noticed. Similar attempts at a marriage flight were observed on June 28th, July 2nd, 10th, 12th, and 14th. June 23rd winged ? ? were seen to help carry about the larvæ. June 27th, a gynandromorphous pupa was noticed (all the other sex pupæ having hatched), the head and thorax appeared to be chiefly ? and the gaster 3. The & & took considerable interest in it, two or three generally sitting round it and tapping it with their antennæ. By July 10th it was unfortunately dead, and the & & had bitten holes in it. July 29th, only a few & and winged \$ \$ still present. August 19th, all the & & dead, and the females had removed their wings. December 31st, very many larvæ (medium and small) present on the floor of the second dark damp chamber, and hung on the walls by their anchor-tipped hairs. There are also great numbers of $\mbegin{aligned} \mbegin{aligned} \mbe$

CAMPONOTINÆ.

Acanthomyops (Dendrolasius) fuliginosus Latr.—On August 17th I visited the birch tree, near Woking, where the battle took place between A. (D.) fuliginosus and A. (Chthonolasius) umbratus, on September 3rd, 1915 [Ent. Rec., 28, 2 (1916)]. The victors are now thoroughly established in the tree, and in considerable strength. 3 ants were present and several mymecophiles occurred in and about the tree. Myrmedonia cognata Märk., Amphotis marginata F., Scatopse transversalis var., in some numbers, and a few individuals of Blanjulus (pulchellus?). The last three had not been found with this colony before. As I witnessed the fuliginosus taking possession of the tree, it is of interest to keep a record of the different myrmecophiles which occur

from year to year here.

The virgin fuliginosus ? which was accepted by umbratus & & in one of my observation nests [see Ent. Rec., 28, 2-3 (1916); 29, 32 (1917)] is still alive. I recorded that on January 28th, 1917, there were ten medium sized larvæ, the brood of the 2, present in the nest. May 1st, a small packet of eggs had been laid, and the ? with her gaster considerably swollen was surrounded by a crowd of umbratus & &. May 22nd, the nest being foul, the whole colony was transferred to a clean, new nest. There were present 231 umbratus & &, the fuliginosus 2, 9 larvæ, 1 packet of eggs, and 2 Amphotis marginata (these two beetles have lived in captivity since May 7th, 1916). May 24th, some & & covering the larvæ with bits of plaster to help them to spin their cocoons. During my absence at West Worthing in June and July, this nest was allowed to get too dry, large numbers of the umbratus \(\preceq \text{ died, and the eggs, larve, etc., disappeared; the fuliginosus ?, a very few umbratus \$ \$ and the two Amphotis only surviving. August 18th, a number of A. (Donisthorpea) niger \(\) cocoons from Woking were introduced into the nest, and collected by the umbratus & &; also three umbratus & & (also from Woking), one of which had an Antennophorus uhlmanni on its chin. One of the strange & attacked the & slightly during the day; at night one of her legs had been pulled off and a dead & lay near her. No more attacks were noticed. August 26th, the & & from the niger cocoons began to appear (the Antennophorus had attached itself to one of the callow niger & D), and by October 13th all had hatched and were surrounding the 2. October 16th, having taken a number of umbratus \(\neq \) at Weybridge, which had been established in a bowl with earth, I began to introduce a few at a time into the nest with the fuliginosus 2, to strengthen the colony. At first the niger \u2222 killed them, and this went on until November, when a few were received. From then up to date, 4, 5, and 6 & & have been added every day, the niger & & no longer attack them, and they neither attack the niger & & nor the fuliginosus ?. November 20th, the fuliginosus ? began to swell with eggs again. December 31st, there are now present 60 niger \u224 \u2244, a large number of umbratus & &, the fuliginosus & surrounded by a court of umbratus, and the two Amphotis.

Acanthomyops (Chthonolasius) umbratus Nyl.—On August 22nd a marriage flight of A. (C.) umbratus took place at Putney (and also of A.

(C.) flavus, A. (D.) niger, and Myrmica laevinodis, all four occurring in my garden). Winged and dealated $\mathfrak P$ were found on the pavements round about, and one dealated $\mathfrak P$ was running on the stonework path near a small niger nest in my garden, carrying a niger $\mathfrak P$ which was not quite dead in her jaws.

Formica exsecta Nyl.—In July I received a letter from Mr. J. J. F. X. King, who was staying at Rannoch, stating that the exsecta nest which I discovered near the Loch at Rannoch, on July 11th, 1911 (see photograph, British Ants, plate xvi., p. 273) is still in the same

spot, not having been disturbed.

Formica sanguinea Latr.—On August 17th I visited the colony of F. sanguinea containing pseudogynes at Woking. The nest was in the same spot it occupied last year, and numerous ξ cocoons were present. A number of these were taken home and introduced into my sanguinea observation nest, and when they hatched later some of them proved to be pseudogynes.

Formica fusca L.—A single winged 2 was captured flying in my

garden at West Worthing on July 15th.

COLEOPTERA.

Claviger testaceus Preys.—Dr. Chapman kindly gave me a specimen of Claviger which he had taken in a nest of Myrmica scabrinodis at Betchworth, on September 22nd, 1917.

Lepidopterology.—Two new European Lycaenids.

By T. A. CHAPMAN, M.D., F.E.S.

(Continued from page 8.)

The second part of the fourteenth volume of the Études de Lépidoptèrologie comparée is concerned with the genus Actinote, the South American representative of the Acraeidae. It begins with a criticism of Dr. Jordan's treatise on the genus in Seitz's Macrolepidoptera of the World. The criticism is not, indeed, of Dr. Jordan, but of the Editor and Publishers, who promised "the classification of each butterfly at first sight, no longer any museum or private collection with unclassified butterflies." M. Oberthür finds, however, that the species of Actinote figured are chiefly long and well known species, but that the new forms and species described by Dr. Jordan are rarely figured. He trusted to the ease and certainty of the determinations, which he expected to find by consulting the work, and he complains that his hopes have been deceived. In this Fascicule he completes by means of the specimens in his collection at Rennes, the work published by Seitz, chiefly founded on the examples in the British Museum and at Tring. Fifty-one species are discussed, and there are 57 figures. Under the head of Actinote anteas, Doubl., he discusses at length the difficulties due to want of figures of the forms described by Dr. Jordan, and commends the Doctor's dictum, "We have not reached satisfactory results." M. Oberthür says we are left like Theseus, in a labyrinth, but with no Ariadne to extricate us by a guiding thread, in this case the necessary figures. He does not hesitate a moment, he regards as nil and non-existent all names not illustrated by a figure, and without hoping to clear up all difficulties, will do his best, with M. Culot's aid,

to enable all entomologists to recognise to what forms the names he

gives to Actinote not hitherto figured apply.

Then follows 250 pp. of Monsieur F. le Cert's Contributions a l'Étude des Ægeriidac. "Descriptions and figures of new or little known Species and Forms." This is accompanied by seven plates with sixty-four figures. M. Oberthür gives a preface to this important paper, a preface in which he tells us that the Ægeriidae have been the object of no complete work, unless we so regard what we find in Dr. Boisduval's Species général de Lépidoptères Heterocères, published in 1874. He gives us various personal reminiscences of the attraction the clearwings always have for the collector, and illustrations of how comparatively common some very rare species prove to be when we know their habits. Andrenæformis in England is a case that occurs to us all in this connection. He relates his experiences of Sesia uroceriformis-armoricana in regard to its sembling and the alertness of its enemies. This species feeds in the roots of gorse, and, though a south European form, occurs in Brittany and might perchance turn up in our south-western counties.

There are also some notes on their mimetism, remarkably illustrated by Pl. cclxxx, with Triscotia rubiginosa, a Javan wasp, closely resembled by a Javan Sesia, Sura ignicauda, and by an Indian species, Trilochana scolioides, and an even more close mimicry of Triscotia procer by Trilochana oberthiiri, both from Java, in which the dark wings and black body, with yellow patches, are much the same in the wasp and in the clearwing. M. Le Cerf's paper is the first written contribution to the subject in the Études, his activities having been delayed and hindered by war duties. There appeared, however, in Fasc. xi., 8 plates with 82 figures, of species from Barbary, and 9 plates in Fasc. xii., presenting exotic species. These, with the seven plates in the present part, are all drawn by M. Culot in his usual masterly manner, and are nearly all from specimens in M. Oberthür's collection. M. le Cerf's introduction refers to various difficulties that meet the students of this family, and finds many of them can only be met by insisting on all descriptions of species being accompanied by a good figure, and by giving, as he does, certain text figures to elucidate special details. He says that figures and descriptions of Egeriidae require the underside of body and legs to be noted as well as the upper surface. There are text figures to give details, with names of the various parts of the surface anatomy. M. le Cerf proposes to publish a series of papers and detached notes, to be called Contributions to the study of Ægeriidae, on the Systematics, the Morphology, the Biology, etc., without professing at present to make it a complete work.

The present paper deals with the exotic species figured in the present

and the xiith Fascicules.

We come again in Part iv. to Considerations about some species of Lycaena. These refer chiefly to observations on the habits of Lycaena alcon and Plebeius argus var. armoricana, to which M. Oberthür and Mr. Powell devoted much careful attention last summer, in which they were assisted by the sharp eyes of M. Oberthür's grandson, M. Hervé Oberthür. Mr. Powell's detailed notes on L. alcon extend to 17 pp. The point of departure was that the life history of alcon cannot be altogether different from that of L. arion, and that the larva was probably reared by ants in a similar way. This proved to be a correct surmise. M. Gillmer proved in 1907 that the larva of alcon feeds in the flowers

or mines in the succulent stems of Gentiana pneumonanthe, reaches its third instar, and then wanders, just as does L. arion in its fourth instar, and that in spite of anything we devised for its benefit (for I had the pleasure of rearing some of these larvæ so far, from eggs sent me by M. Gillmer), it shortly died, just as that of L. arion used to do. In dealing with larvæ, sent me as eggs and as larvæ, by Mr. Powell, I had for some time a difficulty in understanding why Mr. Powell's larvæ were always in flowers and those I reared (so far only of course) always mined in low down succulent shoots. M. Gillmer knew them in the flowers, but had some idea this was not the right place, and got some to mine in the shoots, and he supplied me with plants with such shoots and with eggs. The larve mined in these shoots much as the larvæ of L. orion mine in the thick leaves of Sedum, but remained in the mines till in the 2nd or 3rd instar. The difference between the flower and the shoot is, however, in regard to the habits of L. alcon trifling. The larva enters the flower by boring a hole in it, and its favourite procedure is then to bore into the ovary and then act as a miner and devour the succulent ovules. Mr. Powell took a third stage larva, and placing it in a hopeful place in the field, had the pleasure, with the assistance of M. Hervé Oberthür, of seeing an ant, which he did not capture, but believes was the same as those captured, which proved to be Tetramorium caespitum, carry it off. They watched it for some distance, lost it once or twice amongst the grass, and after tracing it for a time finally lost it before it reached its nest.

Thereafter he prolonged the life of a number of larve by letting

them suck the juice of the pupe of Formica ruta.

Amongst the larve he sent me were three which are still (January 1918) in observation nests of *Myrmica scabrinodis*, these nests are very weak, so that I am not very optimistic as to their future history. I hope to give some account of these larve when success or failure declares itself.

In dealing with *Plebeius armoricana*, later, Mr. Powell relates an experiment, the facts of which are new to me, and may be to others, but are well known to myrmecologists. He says, in a note, "To take the ant (*Formica fusca* var. *glebaria*, Nyl.) we made a little crack or hole in the ant hill, if the ants were not moving about outside (during rain for example). The ants came out at once, savage, with their mandibles wide, then one placed over the opening made in the nest the open end of a glass tube, into which several ants would climb up. We found, in the result, that it was much better to wait until the ants had calmed down before capturing them in the tube, because all those taken whilst they were still enraged died in a few minutes, asphyxiated, apparently, by the formic acid they had set free. I repeated the experiment several times, always with the same results. If one takes the ants quietly, when they have calmed down, one may keep them a long time in a tube plugged with cotton," p. 443.

Mr. Powell's notes on *P. argus* var. armoricana occupy 41 pages, and give many and interesting details of the habits of the butterfly and the larvæ. There are several observations of the egglaying. *Ulex nanus* would seem to be its usual food plant, but *U. europaeus* is also accepted. There are two broods, the larvæ pass the winter in the unhatched eggs, and the butterflies appear at the beginning of July. Of the eggs laid by these July specimens some hatch and produce butterflies in Sep-

tember, others remain over to pass the winter with those laid by the September emergence. The July eggs that do not hatch appear to be more numerous than those that do. It would seem that it cannot be called single-brooded, as it is further north, and at higher elevations, nor truly double-brooded, as it is further south. When I say, it, I mean argus, not specially the var. armoricana, which has of course,

only this restricted habitat.

Mr. Powell had no difficulty in rearing the larvæ, but though he could find on the *Ulex nanus* larvæ of *Everes argiades* and of *Celastrina argiolus*, he never could find, either on the *Ulex* or elsewhere, larvæ of armoricana at large. They were there, of course, but where? One gathers that the larvæ were hunted by searching, but we are not told whether beating or sweeping was tried, one would expect this to produce one or two. Still, one seems forced to conclude that the larvæ were elsewhere than on the *Ulex*. One is inclined to suspect, looking to my experiences in the Val Véni (*Ent. Mo. Mag.*, 1914), that the larvæ were not far off, almost underground and possibly covered with rubbish by ants. The larvæ fed on the green bark of the *Ulex* at the bases of the young spines, this of course in captivity, possibly those at large got more delicate material in young shoots close to the ground.

There are a good many observations on the relations of ants to various "blues," but perhaps more curious, because more novel, is that of a symbiotic relationship between the larva of *C. argiolus* and a small spider which was observed during the search for larvæ of *armoricana*, "We were quite astonished to see frequently a caterpillar on flowers enclosed in the web of a little spider that often settled itself on the flower shoots of the *Ulex*. The larva of *argiolus* seemed in no way incommoded by the spider and its web, and the spider took no notice of

the caterpillar " (p. 430).

Mr. Powell gives careful notes of the progress of a specially observed larva and of others, with very full descriptions of the larva at each stage. In the last stage the few larvæ reared seem to have been very uniformly green, not unlike the palest form figured, Ent. Mo. Mag., 1914, pl. i., and with no indication of the great range of variation in colouring noted in the larvæ of argus found in the Val Veni

(Courmaveur).

Another point that seems clear is that these larvæ had only four instars; as five is the typical number, it will be desirable to determine whether this is characteristic of this race of argus, whether it is aberrant, or whether perchance the spring and summer broods of larvæ differ on this point. A strong suspicion is expressed that the young

larvæ are cannibalistic, but the proof is not complete.

M. Oberthür sums up on the question as to how many species we have been placing together as argus (argyrognomon) in some nine pages. It is impossible to summarise briefly a summary, and space forbids quoting it in full. We must, therefore, be satisfied with an extract. "No one would dream of disputing the necessity of indicating by special names, Lycaena nivea, armoricana, and bellieri. Every entomologist can easily distinguish nivea, armoricana, and bellieri, and no one could confuse these Species or Forms with each other. Hence, being specialised, we must have a special name to indicate each of them. Then are these Species or merely Forms of a single species? That is the enigmatic question."

M. Oberthür, recognising that it is largely a matter of opinion, and showing that other views may be held, says that armoricana, bellieri, and nivea are as good species as ligurica. It was to assist in getting further material to settle these points that he and Mr. Powell worked during last summer on armoricana, and appeal to their friends to study the forms at their disposal, in order finally to clear up these questions.

Coleoptera at Barton Mills.

By H. DONISTHORPE, F.Z.S., F.E.S.

On September 8th I went to Barton Mills for a few days collecting, my principal object being Cionus longicollis Bris., a beetle I had not taken before. Pool had kindly told me along which road I should best find the food-plant, Verbascum thapsus, but when I got on the ground I found I had forgotten which road he said, and of course took the wrong one! After tramping for a long time I only succeeded in finding a single, nearly dead, Mullein spike, but off this I obtained seven specimens of the Cionus. Subsequently, however, I found it in plenty on other Mullein plants all over the district, and no doubt it can always be taken wherever the plant occurs in this locality. After making sure of the Cionus I next endeavoured to locate Brachonyx pineti Pk., a few specimens of which had previously been taken by Sharp (Dr.) and Fryer in the district. After beating innumerable young Scots Firs, I at length struck on a spot where the beetle occurred fairly freely, and some twenty specimens were bottled. It is very hard to see in the net, as it closely resembles the seeds, and especially the bits of buds beaten with it off the fir trees. Fryer told me that he had taken two or three individuals in March off large old firs, but these no doubt were hybernating specimens. The occurrence of this species so far south, which has only been found in the Highlands otherwise in Britain, is very interesting. I then proceeded to hunt for Lycoperdina succincta L., a beetle which was only added to the British list, from this locality, last year by Dr. Nicholson [Ent. Mo. Mag., 52, 253 (1916)], who captured nine specimens out of ripe Lycoperdon gemmatum, on October 1st, and six more on October 4th. Many "puff-balls" were examined without result, but one of the beetles was eventually found under some fungi on a fir stump. One Lycoperdon gemmatum, which was inhabited by a number of small white beetle larve was brought home, and so far I have bred one L. succincta from it; the larva feeding up, pupating, and emerging in less than a month.

Pocadius ferrugineus F., was very abundant in Lycoperdons, varying much in colour and size, the largest I took measures 4.5mm. in length, and the smallest 3mm. I have since bred several specimens from the "puff-ball" I brought home; these having taken much longer to emerge than the Lycoperdina. [Since the above was written I have bred a 3 and a 9 of Caenocara subglobosa Muls., a species new to Britain, from this same puff-ball.]

Other beetles found on Mulleins were—Apion sanguineum De G., on the large lower leaves, and Longitarsus tabidus F., and its ab. thapsi F., in plenty. Another species?, which Dr. Sharp had previously taken here in plenty, and thinks may be distinct, was also common. I had separated mine from tabidus before I sent them to him, and he tells me

he had also tried to do the same with his. We must wait until he has leisure to dissect some of them and study the matter further.

Licinus depressus Pk., was found at the roots of Mullein.

"Lady Birds" were very abundant on the young firs, especially Coccinella 7-punctata L., but though I examined hundreds of them, they only appeared to vary in the size of the body and spots. One specimen only has the 1st spot on each elytron somewhat triangular in shape, instead of being round. It is well known that aberrations are

very scarce in this species.

Hippodamia variegata Goez., was almost equally abundant, but they all appeared to belong to the ab. carpini Geof., with the exception of one specimen which has the head nearly all white (only the base being narrowly black) with four brown spots on the disc; there are four spots on each elytron, which are small, with the exception of the 4th and 5th, which are larger and joined together by a black band. The usual spot at the scutellum is present. Ganglbauer [Käfer Mitteleuropa, 3? 1019] (1899)] writes: "The commonest varieties found in the south, in which the spots are larger and in part connected with each other, can be included under corsica." But this will not do; Reiche (Ann. Soc. Ent. France, 1862, 299) described an aberration corsica, which was common under stones in Corsica, with more marked puncturation, head more black, thorax with yellow spots smaller and narrower side margins, anterior angles less advanced, posterior angles more obtuse, spots on elytra much larger, the 4th and 5th sometimes running into each other, etc. Now my insect does not agree with this description in any particular, with the exception of the 4th and 5th spots!, it would, therefore, be very inaccurate to call it by Reiche's name, and I propose the name ab. ditylotus n. ab., for it. (I may mention that the forms of this insect present in my collection are—elytra with 6 spots on each, this is the type form; elytra with only 2 spots on each = ab. quinquemaculata F.; elytra with 3 spots on each = ab. constellata Laich; elytra with 4 spots on each = ab. carpini Geof.; all taken at Hythe, September 29th, 1893. None of these abs. appear to have been recorded in Britain before, though no doubt they will be present in many collections. There are several other abs. mentioned in the European Catalogue which may well occur in Britain.)

Evening sweeping produced *Thalycra sericea* Stm., and a fine large 2 of what Janson tells me is *Anisotoma pallens* Stm. This very rare species has only once been taken in Britain before, when three specimens were swept by Walker on the sandhills at Deal, in 1878.

Many other common beetles were observed, but are hardly worth

recording here.

Some Account of Bridport and its Neighbourhood from the point of view of the Lepidopterist, particularly having regard to the Geological Distribution of the Species.

By W. PARKINSON CURTIS, F.E.S.

Very little is known about the district. My available sources of information were :— $\,$

(i.) My own and my wife's observations.

⁽ii.) Mr. A. E. Webber's memory and an evening going through his collection.

(iii.) Mr. W. W. Male's note book.

(iv.) Dale's Lepidoptera of Dorset, which it is well known is more than a little unreliable.

(v.) Mrs. Hudson's results at West Bay in August and September, 1917.

(vi.) A few observations by my brother and myself, made on the

occasion of pop visits to Charmouth in years gone by.

I think that Bridport is quite one of the best collecting centres I have ever struck, and the country round is quite the most charming. I suppose readers may think that I was looking at the district through particularly rose-coloured spectacles, since the time was early June, the weather as perfect as English early summer can be, and I was enjoying all the pleasures of a new companionship with the most delightful companion I could possibly find; but putting aside that altogether, Bridport is a very rich district, of an entirely different character from the end of the county I knew best, viz., the eastern end, and I found it excessively interesting. It has one great drawback, which once or twice threatened to be serious. It is a cattle country, and like most cattle countries the hedges are indifferently repaired, the roads are thoroughly bad, and bulls are unnecessarily abundant and. as usual, exceedingly uncertain.

The first thing that strikes one is that most of the hills are firtree crowned, and it is only the hills that are so ornamented, consequently pinivorous insects are very rare. Naturally, after the eastern end of the county, I drew the conclusion that the fir trees grew on outliers of the Reading Beds. I examined as well as I could three clumps. I think that at Drake North is on an Eocene Outlier (or perhaps, bearing in mind Dewlish, not far distant, Miocene), lying I believe on Chalk and not as the 4-inch geological survey charts it on Greensand; that at Bottom Hill, outside Bridport, I am doubtful about. I think it is possibly a similar remnant lying on Oolite, as the soil is sandy.

The Lewesdon clump, and possibly also the Langdown and Golden Cap clumps (which latter two I did not examine, and which at a distance appear to be recently planted) are I believe drift. Lewesdon I examined; I feel pretty confident that Lewesdon is capped with drift, as the stones at the top seemed to me to be Dartmoor Granite. Lewesdon also is the commencement of the bilberry-heather-gorse combination so prevalent in Dartmoor and Exmoor, and as one would expect the typical insects of East Dorset begin to appear, but, oddly enough, mixed here and there with insects one inevitably associates with Sussex

Standing on Lewesdon one gets an interesting panorama. Northeastward is the typical Chalk downland of Dorset, petering out into Great Oolite as the hills reach Lewesdon, less bold hills with flatter tops and usually devoid of fir trees. Westward, Pilsdon, a Greensand outlier, commences the series of treeless, weatherbitten, stonestrewn, heatherelad hills that stretch across Devon, which is geologically so different. Northward, one looks into the limestone hills and hangers of Somerset, and southward and south-eastward, one has the deep rich valleys of the Great Oolite and Inferior Oolite, some cut as deep even as the Lower Lias, all fertilised with the rich detritus of the denuded Chalk and broken down Greensand and Gault. All this country was, when I looked on it in June last, brilliantly yellow with Lotus corniculatus and yellow rattle. Far to the eastward the towering chalk mass of Eggardon stands like a sentinel, barring the way to the centre of

the county.

At the foot of Eggardon and right across to Drake North runs a wild unkempt place called Powerstock Common. It is like a scrubby piece of the New Forest with sparser trees, richer undergrowth, better watered, and less traversed; it is rich with boggy spots, full of yellow flags and edged with scabious. Its call to me was powerful, but time forbade a closer examination than the leisurely G.W. Railway trains afforded, and my information as to this place is all therefore second-hand. From Drake North to the west, at the foot of a bold chalk shoulder, called Warren Hill, lies the biggest wood of the district, Hooke Park, according to the auction posters of a forthcoming sale of this district, 416 acres in extent, bearing a marked resemblance to Bere Wood, Dorset, superficially, but only superficially.

The coast district is a contrast. Thorncombe, the furthest west I made, is Great Oolite piled on Lias and capped with Greensand, with an undercliff much like the Punfield end of Swanage Bay. It produces, I am told, *Epipactis palustris*, the Marsh Helleborine, to complete the

likeness.

Thorncombe, however, nearly touches 600 feet, and is almost sheer to the sea, being protected at the base with indurated masses of Lias. Burton Bradstock, the furthest east, is just at the end of some curious castellated overhanging cliffs of Fuller's Earth, about 200 feet high. In contrast, the coast district is poverty stricken when compared to the exceedingly diversified and rich country of the higher ground

behind Bridport.

From the foregoing you can now picture Bridport standing on Middle Lias in the flat land of the confluence of the placid streams, the Allington, Mangerton, and Brit, which flow down from the hills behind, with a flat plain of rich alluvium between it and the sea. So flat is this land that from our bed-room window, at Bridport, we could see the sea two miles or so distant. Bridport is as it were in the bottom of half a saucer, the edge being the ring of hills which, starting from the sea at Thorncombe on the west, are Eype Down, Quarry Hill, Colmer's Hill, Lambert's Castle, Pilsdon Pen, Lewesdon Hill, Waddon Hill, Warren Hill, Drake North, Eggardon, Boar's Barrow, Stonebarrow, Bottom Hill, a hill I called the 400 foot hill for want of a better name, and the last eastern extremity at the sea again West Bay Cliffs. The formations running up from Lower Lias through the Oolite to the Chalk, or perhaps the Eocene or Miocene, and back through the same gamut to the Fuller's Earth.

A distinctly different facies from that of the eastern end of my native county, an argillaceous and calceous district, and not a silicious sand one. Greener, flowerier, more smiling, less wild, yet giving one the impression of being smaller and more cramped; higher hills but less distance, more streams and less water, and no lakes of importance, and

only the narrowest of fringes of rushes to the streams.

The outcrop of the Gault over the 500 ft. contours gave, however, marshy and rich marshy land at unaccustomed levels. Bogbean at 700 feet is a strange sight to me, Salix infuscata at 600 equally so, when I think of Littlesea and the abundant growth of Salix infuscata there.

It seemed funny to me to climb to the marsh land and find it in narrow very wet valleys, high up, bedecked with marsh orchids, yellow with Iris, and edged with Rock Cistus and Scabious, with pink *Lychnis*

floscuculi and Purple Bugle, and dotted with Equisetum.

Of course I was only in the district from June 2nd to June 16th, arriving late on June 2nd and departing on June 16th, and it was only on alternate days that collecting was indulged in at all seriously, so that my results, though seemingly meagre, represent only some 50 to 60 hours actual work, besides I was more anxious to explore and observe than collect. In addition we only had push bikes; the gradients are very severe, being more often than not single figures under 8. This curtailed our activity—one wants plenty of power. No night work was attempted in deference to the Defence of the Realm Regulations.

A regular collecting expedition would be very fruitful, but personally I should not care to do night work alone there, my hearing is too defective. I think that there is every chance of a bull charging

searchlight, sheet, and everything else.

Taking my captures as a whole they presented the appearance of a limestone country catch. Parasemia plantaginis, the colour of & Polyommatus icarus, their size and abundance, the presence of Adscita (Ino) statices, Heliaca tenebrata, Zygaena filipendulae and Aricia medon (astrarche). Yet this is shown more by the relative abundance of species rare with us in East Dorset than otherwise. The difference, however, between the sandier soil of the Fuller's Earth and the rich lime laden soil of the Oolite and Chalk is very much more marked on the latter. Brenthis selene is very abundant, Euclidia glyphica, Adscita (Ino) statices, Heliaca tenebrata, Melitaea aurinia, and Parasemia plantaginis occur, whilst the common insects are more abundant. The connecting link between the two classes of formations is Aricia medon (astrarche), scarce on both, and a typical limestone soil insect, Zygaena filipendulae, and its race hippocrepidis, also forms a link.

The most marked difference, however, existed between the strip of Gault and Greensand with its wetness and the residue of the area, as it was in that that insect life teemed, it was on that alone that I obtained Melitaea aurinia, whilst Polyommatus icarus was nearer the Irish blue and finer and better scaled. Rumicia phlaeas was larger, Hemaris tityus (bombyliformis) was pretty sure to be seen but not to be caught, Odezia atrata (chaerophyllata) was flitting about, blueblack in the sunshine, Brenthis selene swarmed as I have never seen it before, Callophrys rubi ornamented the bramble and Hamearis (Nemeobius) lucina the hazel. Plusia iota buzzed out of the rushes, whilst Euclidia glyphica

fluttered uncertainly up the grass stems.

On the other hand some insects not present on the Bagshot, the typical formation of East Dorset, but present on the London clay and Bracklesham Beds in the New Forest, and on the Purbeck Limestone and Wealden, which are yet not strictly limestone, are present and spread over the district, such as Pararge aegeria var. egerides, which I am accustomed to look upon as a wood insect. In West Dorset it is an insect of the deep lanes, as it is in Devonshire, not common, but almost never absent from deep and shady lanes, and, as will be noted, restricted to the Oolite. Leptosia sinapis, the Wood White, is still in the locality,

but did not cross my path, though I had several false alarms, and have

since my return had a definite record.

I found that the 4-inch Geological Survey Map is in many particulars inaccurate as to the actual surface deposits; whether by reason of its small scale, or intentional in the suppression of detail, I know not.

Lest I may seem presumptuous to disagree I call attention to the contouring of the district. In the west of the map Gault and Greensand occupy the 500 to 600 contour lines, although the north is badly faulted the faults are mostly north of the Lewesdon—Drake North Watershed (except near Hooke Park). This watershed is a true watershed, and bounds the Brit Catchment area on the north; the faults interfere very little with this Brit Catchment area.

Many eminences which reach above the contours assigned to the mentioned strata, are charted on the Geological Survey as being geologically below their horizon determined by contour; without being too dogmatic, my observations led me to believe this was nearly always

inaccurate. The localities I visited were as follows:-

TOLLER PORCORUM.—This village is at 370 feet, in the valley of the Hooke River, a tributary of the River Froome. It is situate on the Great Oolite. My one and only capture there was the ubiquitous Cabera pusaria, which is a hazel feeder, and very widely distributed.

HIGHER KINGCOMBE.—A small village one and a half miles to the north-west of Toller, higher up the Hooke River, a tributary of the Froome, about 420 feet, still on the Great Oolite. My one and only capture was Xylophasia rurea, sitting on a gate post close to the Hooke River. It is notable however that Genista tinctoria is very abundant at Higher Kingcombe. From Higher Kingcombe a charming and stony lane runs southward, to an eminence called Mount Pleasant. Curiously enough this lane was mostly remarkable for the entire absence of Lepidoptera, no doubt accidental, some very tempting rough ground lies to the east of the lane, over the 600 foot contour, but as other game was afoot that day I did not stop to investigate it. At Mount Pleasant I started to part company with the Geological Survey Map. Less than half a mile from Mount Pleasant, to the south, lies Drake North, and the whole distance is over the 650 foot contour, and is charted Greensand and Gault. I believe this is only correct in part.

Drake North.—This hill has a long narrow tumulus-shaped cap to it. Very sandy and very bracken covered, wooded with Scotch Fir, fine specimen trees of considerable age. Here I took Thera variata, and I saw, but did not take, Bupalus piniavia, which was of course the southern yellow form; it was fairly abundant. I could see no round pebbles, though I looked for them, hence, though I considered the capping Eocene, I stated it with some trepidation, but Greensand and Gault the capping at Drake North is not and never was. The exact height I do not know, but the capping is over 700 feet. Behind the capping, at about 500 yards, are what look like three huge tumuli, just on the western edge of Powerstock Common. These are simply huge mounds of solid chalk, all apparently that is left of the heavy coating of chalk that once lay over this part of Dorset and frowns at one across the

valley to the east from Eggardon.

Drake North marks the dividing line between the Froome water-

shed and the Mangerton River watershed. The contours to the south of it are crowded, only 200 yards separates the 600 and 700 feet contours. An average gradient of 1 in 6. This piece of ground is a collector's paradise. It is a rough, marshy piece of ground, with occasional peeps of Gault on the surface, scored with deep, very narrow, and very small valleys, with a fan of detritus at the end, oozy and messy, but quite safe. I have described the vegetation elsewhere, but when I stepped on to it first I looked at it, and "Gault by all that's wonderful," I thought. It had not occurred to me that I might strike Gault at over 600 feet. Altogether I paid three visits to this locality. and the result of seven to eight hours netting is as follows:--

Melitaea aurinia.—Fairly abundant. The 2 sespecially tend to ab. praeclara, Tutt. A nicely banded 3 that fell to Mr. Male's net was handed over to me. Mr. Male told me he had repeatedly searched

this piece of ground for aurinia without success.

Brenthis euphrosyne.—Not common, very worn, and obviously over. Brenthis selene.—Very common, very fresh, very fine and deep colour. I obtained a 3 with large white spot in the tornal angle of each hindwing.

Callophrys rubi.—Not very common, and getting very worn.

Polyommatus icarus.—Fairly common, and a strong silvery-blue, not unlike the Irish form.

Rumicia phlaeas.—Not common, but very fine. A specimen taken by my wife is a fine aberration lacking the terminal copper band to

the hindwings.

Hamearis (Nemeobius) lucina .- Not common, but curious in its There is a plentiful growth of primrose there, and the eminences between the valleys are dotted with hazel, very stunted bushes. The lucina sat upon these and also in some numbers on the bracken scattered about, indulging in warfare with passing "skippers" and "blues." Previously I have only seen it in woodland.

Hesperia malvae.—Very common, but I did not take any. Nisoniades tages.—Plentiful, but worn.

Augiades sylvanus.—Swarmed every where, but especially in the lane between Mount Pleasant and Drake North. It was, however, sufficiently abundant at Drake North itself to be very pronouncedly in evidence.

Pararge megera.—Present, but not very common. Coenonympha pamphilus.—Present and abundant.

Pieris rapae.—Present, but I did not see P. napi nor Euchloë cardamines.

Thirteen species of butterflies to be met with at one and the same time in an area of about 200 acres.

Parasemia plantaginis.—A single specimen; no doubt plentiful if worked for. Mr. Male tells me he has no knowledge of the previous capture of this insect in this particular district. It may have wandered from Eggardon, as it is abundant on some of the northern chalk downs of Dorset, but in my experience it is an insect of the chalk downs, and I have only met with it in the south on chalk and in Germany on limestone.

Plusia iota.—This insect I found on the marshy ground. I procured three and missed four; they are by no means easy to catch in

the day time. It is an insect which I had not seen alive before, and is absent from East Dorset.

Euclidia glyphica.—I captured three. It was not uncommon, and could be worked up in the grass. This insect I had only previously met with on a limestone formation in Germany.

Panagra petraria.—Very common.

Odezia (Tanagra) atrata (chaerophyllata).—My wife captured a good series. It kept to the dry headlands covered with bracken. The only other localities that I have any personal acquaintance with are on the London Clay and Bracklesham Beds in the New Forest.

Xanthorhoë montanata.—Extremely abundant, as usual.

Zygaena trifolii.—The Five-spot Burnet. There is a well established colony of this insect. I do not think it is lonicerae. I had no means of taking the larva and few cocoons were available, and I only bred one, which I consider to be this species.

Adscita (Ino) statices.—One specimen, freshly emerged. This insect is absent from East Dorset, and in my experience I have only met with it on the cretaceous formation in Sussex and on a limestone formation in Germany, upon which latter it is very abundant.

Hemaris tityus (bombyliformis).—This insect was busy ova-depositing. Altogether I saw about a dozen, none of which gave me a sport-

ing chance. Mr. Male, however, has taken it.

Eriogaster lanestris.—Webs of the larvæ were exceedingly abundant.

Diaphora mendica.—Has been taken here by Mr. Male.

A total of 23 species in this small area, most of them abundant. My greatest regret was my failure with Hemaris bombyliformis, which I have never seen alive before. I had intended to spend an afternoon on it, but a bull broke through two fences to get to the field where we were watching for bombyliformis, and as I knew the fence bounding the field was unsound (I do not mind owning to being afraid of bulls), and I was neither anxious to alarm my wife nor to run any risks with her safety, we beat a hasty retreat, when I found he was trying for weak places in the fence. Subsequent investigation showed our wisdom, as a day or two after I investigated only to find that he had broken both rails and rampaged up and down the field pretty vigorously. I will deal with my extreme western limit and take the next Greensand and Gault formation eminence.

Lewesdon Hill.—This was a disappointment. Mr. Webber had led me to expect great things, but a disastrous fire which had swept the hill the preceding summer had thinned things out, and the hill had had no time to recover. This was strikingly exemplified by the number of teratological specimens I took. Cattle difficulties arose on one of the best parts of hill, and after our Drake North experience my wife and I kept a wide eye open, and as these cattle showed a marked tendency to follow us about at a trot, we put as many fences as possible between us as quickly as was discreet. The hill itself reaches over 900 feet. It is crowned with fir trees and has a deep dell full of fine beech to the east, which dell was ringing with the woodman's axe whilst I was there. It is capped with a very decided capping of the drift, before referred to, which is used as a gravel pit.

The western slope of the hill is covered with heather and gorse,

freely intermixed with bilberry. The heath terminated about the 700 feet contour. Even allowing for the fact that Lewesdon Hill is half a mile south of a line of fault, I do not think it is correctly charted as Greensand from the 600 contour up. I should think 600 to 700, or perhaps 650 to 750 may be right, but the capping, I feel morally certain, is drift. Of course the result from the insect point of view is curious.

Amongst the fir trees Bupalus piniaria was abundant and wild. On the heath Diacrisia sannio was procured, and Ematurga atomaria and Phytometra viridaria were abundant. Mr. Webber tells me one or two specimens of Plebeius aegon have been taken there, and I should not be surprised, as that patch of about 20 acres was precisely like a bit of the heath at Bratley Plain in the New Forest. Between the 600 and 700 foot contour, on what I believe to be the Greensand and Gault, Adscita (Inv) statices is reported to be not uncommon, by Mr. Case of Broadwinsor. I failed however to get it. Hesperia malvae was abundant, so was Nisoniades tages, but it was going over. Mr. Webber tells me that the species at this station is particularly fine and well marked, but I had no opportunity of judging owing to the worn condition of the species. *Callophrys rubi* was in the same condition, flying to bluebells. It was very generally distributed and quite abundant, which is in accordance with what Mr. Webber told me. Rumicia phlaeas was present but not abundant. Brenthis selene not as common as at Drake North, but still abundant.

Mr. Male took Melitaea aurinia here on May 27th, 1912, whilst Mr. Webber says Dryas paphia, Argynnis aglaia, and A. cydippe (adippe) are all abundant at this station. Eugonia polychloros was also taken here in 1902. Aphantopus hyperantus and Heliaca tenebrata are likewise recorded as plentiful by both these gentlemen, whilst Adscita (Ino) geryon can be obtained in the number of about a dozen for an after-

noon's catch.

A drop below the 600 contour brought one down to the Inferior Oolite, where in shady places Pararge aegeria var. egerides appeared, usually singly, in shady lanes round the hill. Callophrys rubi was joined by Polyommatus icarus and Augiades sylvanus, all of which were abundant. Rumicia phlaeas was not common, but the single specimen I procured had the underside spotting sagittate. Perizoma affinitata was quite common in the hedges and flew very wildly and high.

Immediately to the east of Lewesdon is a rounded hill called Waddon, bearing a British camp. I only had a few minutes hurried investigation of this, it is just 600 feet, and reaches the Greensand horizon, but is charted Inferior Oolite. From the soil, I do not feel disposed to question this, nor do I from the solitary insect taken on the

hill, viz., Heliaca tenebrata.

(To be continued.)

OTES ON COLLECTING, Etc.

Coleoptera Notes from Suffolk, 1915 to 1917.—At intervals during 1915, 1916, and 1917 I have collected Coleoptera in the western part of Suffolk, along the line where the sandy warrens meet the fenland. All the places mentioned in the following record are in Suffolk, excepting Weeting and Hochwold, which are just beyond the boundary

in Norfolk. At Brandon the most interesting things taken were Amara consularis, Cymindis axillaris, Platyderus ruficollis, Harpalus picipennis, Sipalia caesula, Heterothops quadripunctula, Sunius piliformis (five specimens taken on the warren by Dr. G. W. Nicholson and myself), Aleochara cuniculorum, Stenus vafellus, S. solutus, S. carbonarius, S. palustris, 2, S. fuscipes, a single specimen of Ilyobates nigricollis; Anacaena bipustulata, Rhantus grapii, and R. exoletus, Bithinus bulbifer and Euconnus hirticollis (also in abundance at Weeting), Silis ruficollis and Cardiophorus asellus, Aphodius constans and A. inquinatus, Longitarsus dorsalis (very abundant among ragwort on the warren in April, and occurred also at Freckenham), Gronops lunatus, Hypera fasciculata, and Hylastes palliatus. But the most remarkable capture among the weevils, at Brandon, was that of a specimen of Brachonyx pineti, found among Scotch firs on the warren on May 1st, 1917. This Highland species is recorded in the Supplement to Fowler as having been taken at "Middenhall," Suffolk. Presumably this refers to Mildenhall, and if so it is no doubt spreading in this district.

At and near Mildenhall were found Haliplus obliquus, Brychius elevatus and Octhebius nanus, Silpha atrata var. brunnea, Poophagus nasturtii, Gymnetron linariae and Ceuthorhynchus setosus. At Freckenham were taken Harpalus consentaneus and one specimen of H. discoideus, Orthocerus muticus in numbers, Tychius venustus and Baris picicornis. But the great find here was made by Dr. Nicholson. Early in May, 1916, he found Dryophilus anobioides in abundance on a patch of broom. When he took me to the place some three weeks later the species was still present in some numbers, but in less abundance.

At and near Lakenheath I have taken Crypticus quisquilius, Helo-

phorus nubilus, Cryptophagus pubescens, Corymbites tessellatus, Cardiophorus asellus, Donacia dentipes and Chrysomela fastuosa.

At Hockwold (Norfolk) I have found Bembidium varium, Stenus nigritulus. Bagous glabirostris, Gymnetron villosulus and G. beccabungae, Ceuthorhynchus melanostictus and Cionus pulchellus. Finally, at Weeting (Norfolk), I have taken Badister sodalis, Bradycellus placidus, Chaetarthria seminulum, Hydrochus brevis, Mycetoporus lucidus, Stenus pallipes, Quedius scitus (four specimens by Dr. Nicholson and myself), Agathidium seminulum, Silvanus unidentatus, and Thanasimus formicarius.—J. W. Allen, 266, Willesden Lane, N.W. 2:

S. convolvuli.—A specimen was taken at rest on a sun blind of a house one and a half miles from the centre of Birmingham, on September 15th, by Master Kerr, of Moseley.—W. Bowater, F.E.S.,

Moseley, Birmingham.

WURRENT NOTES AND SHORT NOTICES.

Mr. R. S. Bagnall, as Chairman of the Sectional Committee, has communicated the series of Reports of the Field Meetings of the Northumberland, Durham and Newcastle-on-Tyne Natural History Society, for 1911 which has just been published. They include accounts of visits to the Derwent Valley in May, Ewesley, Longwitton and Hartburn in June, Harbottle in June and July, Haswell, Easington and Deneholme in July, the Northumberland Coast near Beadnell in September, the Farne Islands in September, and Seaton Sluice and St. Mary's Island in October. The object Mr. Bagnall and his co-workers

sought to accomplish was to study a small group of the Arthropoda, the Myriapods, familiarly called Centipedes and Millipedes, about which very little was known locally. This he has accomplished, a considerable number of species being listed. At the same time the other obscure groups of the Arthropoda were by no means neglected, and we find that in Mr. Bagnall's favourite group the thrips or Thysanoptera, he has recorded several species as new to the British List. In fact during the year the additions to the British fauna were "one order, four families, eight genera and about sixty species of which thirteen or fourteen are new to science." The Report shows that persistent effort on definitely laid out lines will produce in the study of these obscure groups a sure success, and it also shows that there is still a large amount of discovery to be made in this country. When it is remembered that many economic troubles are caused by the advent of vast numbers of minute and obscure insects, it must be recognised that such a study is all important.

Prof. T. D. A. Cockerell is still adding to the number of known fossil insect. In the *Proceedings of the Biological Society of Washington* he introduces three species of special interest. The first, the Hymen-opteron *Trigonalys pervetus*, which represents a family not previously known as fossil. The second, the Protorthopteron *Palaeocarria ornata*, represents a family new to American strata. The third, another Protorthopteron, *Genentomum carri*, an additional species of a rare family containing only two American and five European species.

In the Naturalist for November Mr. T. H. Day gives a series of notes on "Cumberland Dragonflies." He includes thirteen species, among them being Leucorrhinia dubia, locally abundant, and a specimen of Orthetrum coerulescens. Still more Agrius convolvuli are reported, this time from the Louth district, and also an example of Hippotion celerio.

In the Scottish Naturalist for November is a list of Diptera taken in the Isle of Bute by Mr. Percy H. Grimshaw, of the Royal Scottish Museum, in the spring of 1917. Ten species are new records for the Clyde faunal area.

Two additions to the List of British Hemiptera-Heteroptera are announced in the Ent. Mo. May. for November, by Mr. E. A. Butler, viz., Orthotylus virens, taken in Cumberland by Messrs. Day and Murray on sallow and alder, and Acalypta platychila, taken at Brandon some years ago by Mr. Harwood. Both are generally distributed continental species.

The Canadian Entomologist for November contains an interesting and useful article by Harry B. Weiss, on the "Graphic Presentations of Entomological Facts." He says, "Much time and money is expended in the collection of entomological data, and unless this material be presented in a clear and interesting manner, the maximum amount of benefit will not be secured." "Many readers, when they arrive at a page containing detailed information in the form of printed tables . . . are inclined to pass hurriedly over this part and seek a summary if one is to be found." "Not only is time saved for the reader by graphic presentations, but the facts are put before him in such a manner that they appeal to him more strongly, he remembers them better, and it is less possible for him to draw wrong conclusions when quantitative facts are placed before him in accurate proportions." The writer urges that

"Graphic methods are used by banking houses, corporations, railroad companies, statisticians, engineers, and many others in business and professional occupations, and there is no reason why all entomologists should not use them whenever possible." The article, with its examples,

is well worth perusal.

In the Ent. Mo. Mag. for December Mr. E. E. Green describes two species of Coccidae found in Britain as new to science. Pseudococcus newsteadi was found on beech at Camberley, and Lepidosaphes desmidioides on Nephrodium sp. (under glass), at the Royal Botanic Gardens. Kew. Mr. R. S. Bagnall announces a Cynipid, Phanacis centaureae, as new to Britain, from Ryhope Dene, Durham, bred from galls on the large knapweed (Centaurea scabiosa).

Five separata on the Lepidoptera of Central Italy have been recently

received from Dr. Roger Verity, of Florence.

1. "The Geographical Variation of Lycaena coridon, Poda, in Central Italy," in which are introduced three of the newly differentiated races, (1) Race superapennina from the higher Apennine Mts., culminating in Mt. Pratofiorito. (2) Race apuana, from the Apuana Alp, in Tuscany. (3) Race sibyllina, from the Sibylline Mts., near Florence.

2. "The Fauna of the Province of Macerata." This is largely a summary of the work of Signor Orazio Querci and his wife and daughter during the past few years. Many races and forms are differ-The whole of the Macro-lepidoptera of the district are summarised.

3. "A Contribution to the Study of Variation in Lepidoptera, treating chiefly with the material from Tuscany, Macerata (Marche), and Calabria." There is one plate of 49 figures. Numerous new races

and forms are described in detail.

4 and 5. These are Statistical Summaries of the duration of appearance of many species of Lepidoptera in the months of May, June, and July, on the Pian di Mugnone, near Florence (119-274 metres), as indicated by the captures made by Sig. Querci and his family. The tables show the numbers of each sex taken on each day throughout the three months.

In the Entomologist for December, Prof. Selwyn Image describes a new aberration of the variable species Peronea cristana under the name of ab. subnigrana. It is the most common form of the species which occurs in Epping Forest, and is distinguished from the nigrana of Clark by having a division of colour on the forewing, only the upper portion is of a "dull strong blackish-brown," including the button, the lower portion being shining purplish-grey.

The Scottish Naturalist has collected the records of the occurrence of Agrius convolvuli in Scotland this last year. Fourteen counties and the Shetlands, Orkneys and Outer Hebrides, have all been visited by

this "hawk."

The Canadian Entomologist for December contains (1) An account of one of the numerous "Cutworms" of N. America, the larva of Euroa (Agrotis) excellens from British Columbia. (2) Descriptions of new N. American Phycitinae (Pyrales). (3) A Key to the Sub-families of Anthomyiidae (Diptera). (4) The known Nymphs of N. American Species of Sympetrum (Odonata), with two plates. (5) Observations on Chironomus decorus, one of the troublesome midges of N. America, with one plate.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

October 11th.—Lantern Slides.—Mr. Dennis exhibited lantern slides of British Grasses.

P. ÆGERIA IN DEVON.—Mr. Turner, on behalf of Dr. R. C. L. Perkins, a large number of *Pararge aegeria*, bred and captured this year in continuation of his investigations of 1916, and summarised the conclusions

so far arrived at by the late Mr. A. E. Gibbs and Dr. Perkins.

DWARF RACE OF A. CORIDON AND SEASONAL NOTES.—Mr. A. A. W. Buckstone, series of Agriades coridon, including (1) somewhat small specimens for the Surrey Hills; (2) dwarf specimens; (3) normal sized specimens from other Surrey localities and Royston for comparison, and read notes on the dwarf race. He also contributed "Short Notes" (1) The abundance of Blatta germanica at the Admiralty restaurant. (2) The abundance of Vanessa io near Dorking. (3) The occurrence of Hesperia malvae at Byfleet, July 7th, Guildford, July 12th. (4) Pupæ of Lycia hirtaria passing three winters in that stage. (5) The perfection of the imagines of Ligdia adustata in autumn in the pupa for emergence in the spring. (6) The large percentage of autumn larvæ which have been parasitised. (7) Reported the occurrence of both Colias hyale and C. edusa in Surrey, on October 1st.

THE THISTLE GALL, U. CARDUI.—Mr. Brooks the gall of the Cecido-

myid, Urophora cardui, on thistle.

Two destructive beetles.—Mr. West (Greenwich), the beetle Necrobia runpes which had devastated stores of copra and spread in numbers to neighbouring dwelling-houses, and Rhizophagus parallelocollis which had attacked decayed seed potatoes at Brockenhurst.

LYCENID ABERRATIONS.—Mr. Leeds, many aberrations of Agriades coridon and Polyommatus icarus from the Chilterns, Herts, and Hunts.

Vanessids in Cheshire.—The Rev. F. M. B. Carr reported V. io and

Pyrameis atalanta as very common in Cheshire this season.

October 25th.—Decease of a Member.—The decease of a member Mr. Archer (1914) was announced. He was with the army in Egypt.

PAPER.—The President read a paper on "The Pieridae," dealing chiefly with the "lines of variation" in each of the species which usually breed in Britain, and illustrated his remarks with diagrams and the specimens contained in the various collections of the Society.

ABERRATIONS OF BRITISH PIERIDS.—Mr. Leeds, aberrations of *Pieris rapae*, 3 without spots, 3 large, 3 sthird brood small, 2 deep yellow below; P. brassicae, 2 blotched with bright green, 2 pale blue below,

♀ very large; P. napi, ♂ third brood small.

EXOTIC PIBRIDS NOT WHITE IN COLORATION.—Mr. Moore, exotic "whites" to show that many species were not white, Tachyris nero, red: Archonias critias, nearly all black; Appias celestina, blue; Nepheronia thalassina, pale green; Teracolus sp., irridescent at apex; and Leptophobia sp., silvery lustre below. He also showed Leucidia brephos, the smallest Pierid known and the much debated Pseudopontia paradoxa.

Cionus Longicollis.—Mr. West (Greenwich), the local Coleopteron

Cionus longicollis, a series.

A CAYENNE PEPPER FEEDER.—Mr. Bunnett, the Coleopteron, *Ptinus tectus*, which had attacked some cayenne pepper, and also the curious concentrically formed fungus *Daldinia concentrica*.

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Duplicates.—Euphrosyne, Selene, Blandina, Hyperanthus, Davus, Corydon, Ægon, Asiliformis, P. populi, Mundana, Russula, Moneta, İota, Pulchrina, Festucæ, Lupulinus, Hecta, Ericetaria, Leucophæaria, Strigillaria, Didymata, Fumata, Muricata, Albulata, Imbutata, Atrata. Desiderata.—Pictaria, Notata, Brunneata, Blomeri, Rubricata, Rusticata, Straminata, Subsericeata, Blandiata, Lobulata, Munitata, Quadrifasciaria, Fluviata, black pairs only.—James Douglas, Thorncote, Chellaston, nr. Derby.

Duplicates.—*Dissimilis, Velleda, Fibrosa, *Ambigua, Fulva, *Lubricipeda var. Fasciata, *Plantaginis, Coracina, Captiuncula, Mundana, Lutosa, Togata, *Valerianata, Cilialis, Inquinatellus, Caledoniana, Variegana vars. Sauciana, Geminana, Cinerana, Brunnichiana, Schulziana, Congelatella, Occultana, Vectisana, Dorsana, Rusticana, *Suboccelana, *Strobilella, Nanana, Herbosana, Petiverella, T. corticella, *Œcop, Fulvigutella, etc. Desiderata.—Good Pyrales, Tortrices, etc.—T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough.

Duplicates.—East African butterflies wanted, butterflies of any country except species occurring in Britain.—W. Feather, Kibwezi British East Africa.

Desiderata.—Pieris napi—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; Pararge ægeria from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—G. T. Bethune-Baker, 19, Clarendon Road, Edgbastom.

Duplicates.—Machaon*, Sinapis, Edusa, Hyale, Valezina, Artemis*, Cinxia, Athalia, C-album*, Polychloros*, Sibylla*, Cassiope, Blandina, Davus, Betulæ*, Artaxerxes, Arion, Acteon, Galii*, Scoliæformis*, Minos, Exulans, Meliloti, Albulalis, Helveola*, Quadra*, Cribrum, Hera*, Fuliginosa*, Fascelina*, Cratægi*, Callunæ*, Trifolii*, Versicolor*, Lapponaria*, Hispidaria, Glabraria*, Abietaria*, Obfuscata, Trepidaria*, Smaragdaria*, Orbicularia*, Auroria, Fumata, Pictaria*, Alternata*, Carbonaria, Pinetaria, Cæsiata, Ruficinctata, Salicata, Pygmæata*, Togata*, Sexalisata, Munitata, Fluviata, Lapidata¶ Undulata, Reticulata, Nubeculosa*, Chaonia*, Or, Flavicornis var. Scotica*, Ridens*, Leporina, Menyanthidis, Myricæ, Concolor, Templi, Agathina*, Conspersa, Barrettii, Occulata*, Tineta*, Glauca, Rectilinea, Peltigera, Melanopa, Cordigera, Interrogationis, Bractea, Craccæ, etc. Desiderata.—Varieties and local forms.—Arthur Horne, Bonn-na-Coille, Murtle, Aberdeenshire.

Wanted, for research purposes, during 1917, ova and larvæ of almost any species of British Lepidoptera. Offered British beetles (many scarce or local) and microscopic mounts.—Geo. B. Walsh, 166, Bede Burn Road, Jarrow-on-Tyne.

Note.—Mr. Donisthorpe will be grateful for any ants from all parts of the British Isles, with localities, unset or otherwise, for the purposes of study.—H. St. J. K. Donisthorpe, 19, Hazlewell Road, Putney, S.W.

I would be very glad to exchange Californian butterflies for English blues especially the variable \Im s, and the blue \Im s of coridon such as have been recorded by Keynes and others.—Fordyce Grinnell, Jr., 712, East Orange Grove, Paradena, California, U.S.A.

Duplicates.—Artemis* (Cornish), Tithonus extra spotted vars., Corydon var. Semi Syngrapha (fair only), Tilice*, Angularia* (Quercinaria), fine banded vars., Bicuspis* and many others, also Pupæ Lacertula, Falcula, Tiliæ, Consortariā, Versicolor, etc. Desiderata.—Perfect only Cardamines δ s, Cardui, Iris, Ocellatus, B. quercus, Chlorana, Ligniperda, Humuli, Convolvuli, and many others. Also Pupæ Carpini, Porcellus, Callunæ, Dictæa, Dictæa, Dodonea, Vinula, S. ligustri, and many others. Liberal exchange or cash.— $L.\ W.\ Newman,\ Bexley,\ Kent.$

Desiderata.—Euchloë cardamines from Ireland; also types of E. cardamines from Switzerland, Italy, S. France; var, turitis (S. Italy), var. volgensis, var. thibetana, and of E. gruneri, F. euphenoides, E. damone, and any palearctic species of the genus. Duplicates.—Loweia dorilis and vars., a few minor vars. of R. philaas (British), and many British lepidoptera.—Harold B. Williams, 82, Filey Avenue, Stoke Newington, N.

Duplicates.—Ova: Cervinaria, Neustria. Larvæ: Ornata, 5 Falcula, 5 Lacertula, Caja; Pupæ Persicaria, 6 Populi. Imagines: Adonis, Corydon, Irish Napii, H. comma, Tages, Malvæ, Sylvanus, 2 Tipuliformis, 8 Cynipiformis, 1 Culiciformis, 2 Bembeciformis (fair only), 6 B. quercûs, 9 Carpini, Humuli ?, 13 Hirtaria, 7 Macilenta, 1 Papilionaria, Ornata, Gilvaria, 2 Crepuscularia, cervinaria, 4 Punctularia, 3 Palumbaria, 2 Falcula, Lunosa, Vaccinii, Spadicea, 4 Lutulenta, Cruda, Stabilis, Gothica, 6 Instabilis, Rumicis. Desiderata.—Very numerous, pupæ and imagines.—F. T. Grant, 37, Old Road W., Gravesend.

Duplicates.—Cardamines ? ? s. Brassicæ, Rhamni, Euphrosyne, Selene, Aglaia, Adippe, Io,* Galatea, Egeria, Hyperantus, Ianira, Semele, Megera, Icarus, Bellargus, Argiolus, Lucina, Quercus, Rubi, Malvæ, Tages, Sylvanus, Comma, Filipendulæ, Trifolii, Jacobææ,* Mendica,* Russula & s. Caia*, Auriflua,* Falcula, Neustria,* Pavonia,* Flavicornis, Duplaris, Pallens, Arcuosa, Rumicis, Graminis, Gemina, Comes,* Xanthographa,* Secalis, Pisi,* Piniperda, Gothica, Cruda, Baia, Meticulosa, Rufina, Brassicæ,* Litura, Satellitia, Oxyacanthæ var. Capucina, Vaccinii, Lithargyria,* Incerta, Pistacina, Fulvago, Triangulum, Trapezina, Mi, Glyphica, Myrtilli, Parthenias, Maura,* Maculata, Advenaria (very fair), Autumnaria,* Abruptaria, Pilosaria,* Hirtaria,* Obscurata, Biundularia, Consortaria, Consonaria,* Punctulata, Pendularia,* Belgiaria, Gilvaria, Adustata,* Clathrata, Pulveraria,* Pusaria,* Pictaria, Albulata, Multistrigaria, Fluctuata, Ocellata, Montanata, Procellata, Albicillata, Bicolorata, Badiata, Aurantiaria, Marginata, Boreata, Dilutata, Leucophearia, Carpinata, Impluviata, Juniperata, Rufata,* Mensuraria, Firmata,* Obeliscata, Pyraliata. Black pins and full data. Pupæ of Jacobææ and Hispidaria. Desiderata.—Local species and local forms of British Macro-Lepidoptera, particularly northern.—A. W. Buckstone, 307a, Kingston Road, Merton Park, London, S.W. 19.

MESOFOTAMIA.—I should be glad of information on insects or news of other entomologists in this country.—P. A. Buxton, Fairhill, Tonbridge.

Duplicates.—European butterflies unset on long pins and some set English fashion. Desiderata.—Common British Noctuids.—Hy. J. Turner, 98, Drakefell Road, New Cross, S.E. 14.

Duplicates.—A. coridon vars., including semi-syngrapha, H. Comma. Desiderata.—A. coridon var. Albicans (Spanish) and var. Hispana (do.), and good butterfly vars., especially from Ireland.—Douglas H. Pearson, Chilwell House, Chilwell, Notts.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1918, Mar. 6th and 20th; Apr. 3rd; May 1st.

The South London Entemological and Natural History Society, Hibernia Chambers, London Bridge.—Meetings: The second and fourth Thursdays in the month at 7 o'clock.—Hon. Sec., Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. Hon. Sec., J. Ross, 18, Queens Grove Road, Chingford, N.E.

Toynbee Natural History Society.—Toynbee Hall, at 8 p.m. Entrance fee ls., annual subscription ls. *Meetings*: Full particulars as to excursions can be obtained from the Excursion Secretary, Miss L. Roberts, 11, St. James, Hatcham, S.E. Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpeol, on the 3rd Monday in each month from October to April.—Hon. Sec., Wm. Mansbridge, 4, Norwich Road, Wavertree, Liverpool.

East London Natural History Society.—Bromley Public Hall, E. Thursdays at 8 p.m.—Hon. Sec., J. C. W. Shears, 58, Selborne Road, Ilford.

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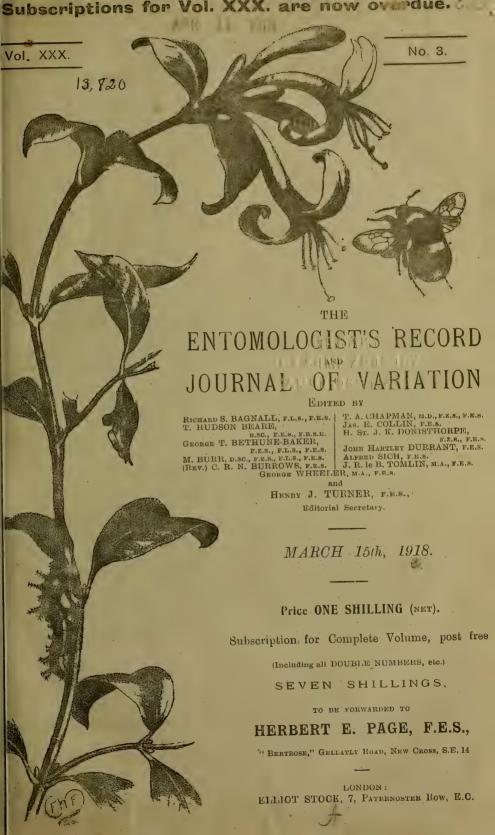
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Inbreeding Amphidasis betularia. By CAPT. BOWATER, R.A.M.C.T., M.C., F.E.S.

In the course of an experiment, undertaken in 1909 in order to investigate the heredity of melanism in Lepidoptera, *Amphidasis betularia* was one of the species used, and it proved itself capable of with-

standing considerable inbreeding if due care be taken.

In many cases pairings were infertile, and those fertile often produced larvæ so weak that they failed to reach maturity, but several families were carried through each year, and the strain was kept going till August, 1914, and then my wife, although quite untrained in entomology, took over the larvæ, and with some aid from my sister, carried them through, and cared for a further generation in 1915, which successfully produced imagines in 1916. The 7th generation.

I record this now as I fail to find in the literature a record of

success with more than three generations of this species.

The original parents were Black × Type, their offspring all intermediate. Four pairings amongst these produced four families consisting of type and intermediate specimens. A type 3 from one and an intermediate \$\foat2\$ from another were paired and produced a family (the only one in the year) of 39 specimens (a good example of clean Mendelian segregation), 19 being strictly type, and 20 intermediate, and all the 20 are exactly the same style.

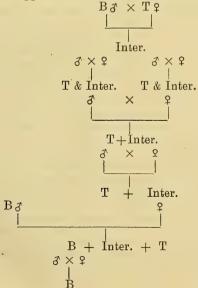
A type 3 and an intermediate 2 were paired, and in 1914 five moths emerged, two type and three intermediate. The darkest of the latter, a 2, paired with a wild Bexley black 3, and deposited about 400 ova, from which 250 pupe were raised, and in 1915 107 black, 60

intermediate and 59 type moths emerged.

Two of the black were paired, and their family of twelve, all black,

appeared last year.

Seven hundred and thirty-one specimens were reared in the whole experiment. Apple and sallow were used as food-plants.



Максн 15тн, 1917.

I am much indebted to my friend Mr. Edwards, of Birmingham, for invaluable help, for he took care of the pupæ, and killed and set the imagines for me, in spite of the very numerous calls on his time.

I hope to record further details at a future date, as other small families of the same strain were reared during the six years, and all tend to prove that Mendelian laws of heredity prevail in A. betularia, although the occurrence of intermediate forms and the special liability to disease of this species when in captivity, have prevented the accumulation of much evidence to support this.

Prolonged life in a headless ant.

By T. A. CHAPMAN, M.D., F.E.S.

October 15th, 1917.—Mr. Donisthorpe took a colony of Myrmica

scabrinodis at Weybridge.

October 21st.—Mr. Donisthorpe says that all the ants of this colony have entered the new nest. On one or other of these dates or on some intermediate one, a certain ant became decapitated.

October 25th.—The above nest passed into my possession for the benefit of the larva of Lycaena alcon, and Mr. Donisthorpe pointed out

to me the headless worker.

November 2nd.—The headless ant is still alive.

November 3rd.—It has moved to the next compartment, no doubt moved by ants; as it does not seem to move voluntarily, but sits up and moves a little when touched by passing ants.

November 4th.-Moved to another compartment, no doubt carried.

November 5th.—As well as usual.

November 10th.—Seen to-day, quite lively, is away from other ants, moves when touched.

November 13th.—Still living.

November 14th.—Found in midden, lively, removed it from midden.

November 15th.—Is being held by another ant, seemed as usual when released.

November 18th.—Lively.

November 19th.—Carried or held by an ant, kicks in a lively manner.

November 24th.—Unseen for two days. It is to-day amongst the ants in brood nest, to which it must have been carried by ants, it is seen when they scattered, seems alive and well.

November 26th.—In centre of a compartment, well.

November 28th.—In middle of a compartment, seems strong, but

doesn't move unless touched.

November 29th.—Now alone in space beyond the one in which it was yesterday, obviously carried by ants. A few days ago it was noticed to be without the second left leg. It was assumed that this had occurred in the original accident in which the head was lost, but had been overlooked, though it was looked at so often that it seemed an explanation hard to accept. To-day all three left legs are missing. Two of these, therefore, and almost certainly the first also, must have been removed by the ants, either intentionally or in struggles as to who should carry it off. It sits up on the three right legs and gets on them again when shoved over.

November 30th.—Found in the midden, it is, however, quite lively, though it has now only two legs, the right hind leg being now missing.

December 1st.—Is alive and with two legs, is nearly where left yesterday, an ant stood over it as if holding it, but went away when

disturbed.

December 3rd.—Alive and lively (for her).

December 6th.—Not seen for two days, probably in ant mass, today is in midden, but, when washed, uses her (2) legs as actively as ever.

Docember 7th.—Alive, alone.

December 8th.—Lively.

December 9th.—Alive and well.

December 11th.—Rescued from midden, washed, quite lively.

December 12th.—Found in midden, apparently drowned in melted honey, the ants having made midden on the glass on which honey was offered them, when cleaned moved legs feebly, but doesn't look likely to recover.

December 13th.—Really dead.

This ant lived possibly from October 15th, certainly from the 21st, until December 12th without its head, a minimum period of 52 days, or a possible maximum, October 15th to December 18th, of 59 days.

Mr. Donisthorpe tells me there are records of a headless ant living

22 and 29 days.

It had no initiative, and unless touched did not try to move, but moved its legs readily when disturbed. The ants carried it about: always, however, leaving it solitary in the middle of a compartment of the nest until the 29th day (dating from October 15th) when it was found in the "midden," usually a bit of glass placed in the nest with food for the ants on it. Rescued from this, it was found next day held by an ant, and again four days later. On the 40th day it was found in the brood-nest, where it had apparently been for two days, during which it had not been seen elsewhere. For some days after this it was left alone in the middle of one compartment or another, but carried to a fresh one, of course by the ants. About the 42nd day it lost a leg. and on the 45th it had lost all the left legs. On the 46th it was again in the midden and had lost another leg, having now only two, it was quite lively when rescued. On the 52nd day it was found again in the midden, but from not being seen had probably been for two days in the brood-nest. Remained till the 57th day, alive as before, but was then found in the midden, rescued, and seemed lively. On the 58th day was found in the midden drowned in honey; when rescued and cleaned moved feebly, but was quite dead on the 59th day.

This history shows how the ants treated the maimed individual, except as to whether they removed its limbs accidentally or intentionally. It may be worth noting that it survived 15 days after losing a leg in addition to its head, and for 12 days the loss of four of its legs. Its life was probably shortened by the drowning, owing to my not having seen and rescued it in time, and not altogether due to debility

from its injuries.

[Note.—The ant in question was probably decapitated with the glass roof pane of the observation nest, on the evening of October 15th, when a few \u224 \u224 were placed in the nest, to show the way to the

rest of the colony into their new home. I agree with Dr. Chapman that if it had not been partly drowned in the honey it would have lived

even longer.

The other two records of headless ants are—a \(\times \) of \(M. \) ruginodis, which was kept alive by C. C. Best Gardner for 21 or 22 days \(Brit. \) Ants, 119 (1915)], and a \(Formica \) rufa \(\times \) which Janet had under observation for 29 days before it died \([C. R. Acad. Sc. Paris, 127, 130 (1898]; \) Brit. \(Ants, 249 (1915) \)].—H. Donisthorpe.

Some Account of Bridport and its Neighbourhood from the point of view of the Lepidopterist, particularly having regard to the Geological Distribution of the Species.

By W. PARKINSON CURTIS, F.E.S.

(Continued from page 36.)

HOOKE PARK.—I now cross to the east again. This place is about half a mile west of Drake North, but occupies the talus slopes and foot of Warren Hill, from 300 feet to 520 feet. In composition it is a bit of a puzzle; it is a large wood, 416 acres, and when my wife and I were there it was so breathlessly hot that we were not precisely energetic. I don't think I even scampered over one-eighth of its area. It appears to be a place easily able to live up to its reputation. It hardly ends abruptly at the foot of Warren Hill, as it peters out into stunted trees and bushes at 550 feet, above which Warren Hill reaches 661 feet. Just here matters are complicated by three parallel faults running about W. 1/2 N. Warren Hill is charted as Greensand and Gault. Actually the top of it is white Chalk, but the débris on which Hooke Park stands is puzzling. Nominally the upper part of the wood is narrowly bordered by Greensand, the main part of the wood is Great Oolite, the extreme southernmost fringe, where the wood runs from 25 feet below to 25 feet above the 300 feet contour line, is Inferior Oolite. In some places the soil has a tendency to a white clayey consistency, which is agreeable with the charting, but the major part has a surface soil of a light sandy nature, reminding one of the Reading Bed portion of Bere Wood (East Dorset), a resemblance heightened by the presence of rhododendron. This may be broken down Greensand and Gault, but I suspect with a strong admixture of what was once an Eccene or Miocene capping to Warren Hill and Drake North. The most striking feature of the wood is the undergrowth, little hazel, some sallow, an abundance of alder, and no birch. Birch I never saw in the district at This gives the wood a rather sombre tone, and no doubt gives it a special fauna. There is a wealth of stunted sloe on the outskirts, but the little casual beating I did for Ruralis (Zephyrus) betulae was not productive of the desired result. My own captures in the wood were limited. Gnophria rubricollis literally swarmed on two afternoons, dancing round the tops of the trees, but hardly ever coming within reach. They occasionally volplaned down to the tops of the alders. By using a tall ash beating stick as a handle for one net and a 15 foot green alder stick of uncertain weight and pliability for another, my wife and I managed to get about 30. It is no exaggeration to say that every tree had a tassel of 50 to 100 of these insects on the lee side, dancing like May flies, or skittering round the top of the tree like mice. A single specimen of Drepana falcataria was obtained notwithstanding the absence of birch. It is, moreover, an exceedingly large one. Argynnis selene was present, but less abundant than at Drake North. Both Mr. Male and Mr. Webber record this insect for the wood. Hemaris fuciformis I saw once flying at bugle, and later I saw a specimen flying at bluebell. Mr. Webber has also seen it here and taken it, but says it is not common. This estimate is probably not correct. I have never seen H. fuciformis on the wing at Poole, but I can always find two or three dozen larvæ in an afternoon if I want to do so. Probably the larva would be readily obtained at Hooke Park if searched for properly. Xylophasia rurea was picked up on a gate post entering the wood. Xanthorhoë montanata was abundant, of course. I got a single worn ♀ of Numeria pulveraria. Pyrameis atalanta was exceedingly abundant and as a rule in fine order considering the time of the year. I saw one large solitary butterfly, which could only have been Apatura iris or Eugonia polychloros, sailing round the top of an oak. I sat down and watched it for half an hour without getting any nearer to its identity than my first guess. The action was certainly that of A. iris. Of course it was late for the larva, and though I searched and beat sallow in that vicinity I saw nothing to confirm my guess. I feel sure the wood would amply repay investigation.

Mr. Male (M) and Mr. Webber (W) record the following insects:—
Melanargia galathea (M), Argynnis paphia, A. cydippe (adippe), A. aglaia,
Brenthis euphrosyne, all abundant (M & W), Hemaris bombyliformis (M & W), A. paphia var. valezina, by T. T. Male in the early 1870's (fide W), Limenitis sibilla, in 1907 (fide W), Apatura iris, in 1902 (fide W),

and Bithys (Zephyrus) quercûs (W & M).

Mr. Male used to take *Melitaea aurinia* in a damp field at the entrance to Hooke Park. I am satisfied I investigated the right field, I am equally satisfied that the field has of recent years been drained and probably the Drake North colony is the old colony (see Mr. Male's remarks under Drake North). Zygaena trifolii var. confluens has also

been obtained by Mr. Male.

Broadwinsor.—This village is really out of the area, as it is on the northern side of the Lewesdon-Drake North watershed, and really belongs to the Axe catchment area, and not to the Brit catchment area. I visited this place to get Melitaea aurinia, but ended up by missing the locality and running down into a flowery meadow lying on the Inferior Oolite, but rich with the detritus of the Great Oolite, Gault and Greensand higher up. This meadow was intersected with streams fringed with trees. Euchloë cardamines and Pieris napi were abundant. Brenthis selene was an occasional visitor. Pararge megera was abundant, as was Rumicia phlaeas, a nice specimen of var. schmidtii falling to my wife's net. Polyommatus icarus and Plusia gamma were common. Euclidia mi and E. glyphica were both not uncommon, though the latter eluded capture. Heliaca tenebrata was very abundant but very difficult to catch. (It will be noted that I got this insect no higher than the Inferior Oolite.) Hylophila prasinana 2 was found sitting in the grass at the foot of an oak tree. Melanthia ocellata and Xanthorhoe montanata were taken in the hedges surrounding the field; a single Pyrausta cingulalis and Crambus dumetellus complete the list, save for an Eriocephalid which swarmed in the buttercups, and made a really beautiful picture, their metallic bronze shining in the sun thrown up by the strong yellow background was very striking. They

were busy eating the pollen, as far as I could see, but I managed to lose sight of the dozen or so I caught, so I can hardly say I know what they are. In the field I considered them *Micropteryx seppella*, Fab. Mr. Case, a local entomologist, obtained *Melitaea aurinia* regularly, but I missed the locality owing to working on too small a scale map. The same gentleman obtained *Manduca* (Acherontia) atropos here on September 2nd, 1914, and *Limenitis sibilla* in 1917 at Four Ashes, quite near to Broadwinsor.

Mr. A. E. Webber has also taken Argynnis cydippe (adippe) and Hamearis (Nemeobius) lucina here. With regard to the Melitaea aurinia

this locality was on the Greensand and Gault I now know.

Powerstock.—This village lies below the 500 contour line, just under Drake North, on the Inferior Oolite. There is a profusion of Lotus corniculatus and Anthyllis vulneraria. I passed through it once and obtained Pararye aeyeria var. eyerides and Polyonmatus icarus. It will be noted that although var. eyerides descended as low as the Lower Lias, I never obtained it higher than the Inferior Oolite, nor did I obtain it in woodland.

Poorton.—This is a district rather than a village, mostly above 400 feet and below 500 feet, lying south of Hooke Park and south-west of Drake North. It is nearly all Inferior Oolite, and in the shady lanes I looked in vain for Leptosia sinapis, which Mr. Webber used to obtain there sparingly in the early 1880's. I found P. aegeria var. egerides fairly frequent, also Melanthia ocellata. I also found two empty cocoons and one pupa (unfortunately ichneumoned) of Cerura bifida. In this district I crossed a small area of Great Oolite, and there I got a solitary Aricia medon (astrarche), an interesting capture, as Mr. Webber and Mrs. Hudson both record the insect as more nearly common at Bothenhampton Quarries, also on the Great Oolite. Pyrameis cardui was careering wildly about, and I got a single Cosmotriche (Odonestis) potatoria. Mr. Webber records Callophrys rubi. I did not see it myself, but Poorton was only taken en route for Drake North, and the examination was casual.

That practically finishes the high ridges to the north of Bridport. Poorton is strictly independent of the high ridge from Lewesdon to Drake North, but has the appearance in the distance of being a secon-

dary ridge of foot hills.

DOTTERY.—About five miles from Bridport, on the Lewesdon Road, is a village of this name on the Middle Lias. I merely passed through it, capturing *Heliaca tenebrata*, which was dancing about the hedges, and taking a single larva of *Lasiocampa quercus*. It will be noted that

this was the lowest horizon I obtained H. tenebrata upon.

Allington.—A small hill just outside Bridport, to the west. It has a capping of Inferior Oolite, and is just over the 200 foot contour. It has the appearance of having been entrenched at some time. Here I got Euchloë cardamines, which is a really common insect round Bridport. Polyommatus icarus was abundant, and included a fair number of 2 ab. caerulea. Aricia medon (astrarche) was not uncommon but over, and I was only able to pick one presentable specimen. It will be observed that Inferior Oolite is a calcareous rock. Euclidia mi was abundant, Pararye meyera in evidence, whilst Epinephele jurtina (ianira) was just emerging. Zyyaena filipendulae was present but not common. I obtained two. Having regard to the time of emergence, the width of

the terminal band, the division of spot 6 by nervure 5 in the forewing, and their condition, which was past its pristine glory, I have no particular hesitation in referring these specimens to the race hippocrepidis. True filipendulae is due out in Dorset about the third week in July.

Symondsbury.—I only walked round one evening; my captures were *Cacoecia ministrana*, a Tortrix I had always associated with birch copses in East Dorset, and *Xanthosetia hamana*, a fairly ubiquitous species. The actual place of capture in each case being on the Inferior Oolite. Mr. Webber records a single *Colias hyale* and an abundance of

Brenthis euphrosyne for this locality.

Bridport Town.—This stands on the Lower Lias. It is a cheerful, clean country town, with wide streets that would do credit to many larger places. My captures were chiefly casuals that flew in at the windows. Hipocrita jacobaeae was common in the garden, having assembled to a crippled ? I brought up from Eype. Arctia villica was also obtained. Mamestra (Barathra) brassicae and Triphaena pronuba, which are nearly domestic insects, were taken. Triaena (Acronicta) psi was found sitting on a poplar tree. Mr. Male gave me a bred series of Amorpha populi and Dicranura vinula of local origin. Mr. Male also, with great generosity, presented me with a very fine Hyloicus pinastri, which had been taken on July 14th, 1917, on a wall in South Street, Bridport. The insect is in beautiful order, but the state of the fringes show that it had flown some distance. This is an odd capture in a district where Pinus sylvestris is scarce and presumably a migrant. Mr. Webber tells me Colias edusa was not uncommon at times, which record Mr. Male confirms for 1917, when the insect was by no means uncommon. Goneptery, rhamni is not common as Rhamnus is a rare plant there. Mr. Male records Celastrina argiolus as not uncommon in 1900, 1901 and 1902, and in 1906 I saw two myself. Mr. Webber says fairly common throughout the district. Mr. Male also records Cossus ligniperda bred from plum, July 3rd, 1904, the second he has seen in 30 years. (Mr. Webber, however, says the larvæ are destructively plenti-Smerinthus ocellatus, Lachneis (Eriogaster) lanestris, Phalera bucephala, Manduca (Acherontia) atropos one, on November 6th, 1905, also in 1910 and 1911. Odontopera bidentata, Cucullia verbasci, and Amphipyra pyramidea. Pyrameis cardui was common in 1906 and 1917, Eumorpha elpenor first taken on June 24th, 1907, but bred from larvæ both in 1909 and 1910. Habrosyne derasa and Thyatira batis. Sphinx ligustri was fairly common. Agrius convolvuli in 1911 and 1917, also by Mr. Webber. Mimas tiliae not common, though there are a fair number of limes in Bridport. Sesia (Macroglossa) stellatarum very abundant in the season 1911 (A. E. Webber). Aegeria tipuliformis, Lasiocampa quercus, Amphidasis betularia not common, and Triphaena fimbria one specimen in 1917. In conversation with Mr. Male, and in going through his collection, I ascertained, however, that Plusia gamma, P. chrysitis, and P. iota were common on flowers in his garden, and P. pulchrina occasionally put in an appearance. Mr. Webber records Nudaria mundana occasionally at the lamps, Cybosia mesomella not commonly, Arctia caia common, A. villica fairly so, Phragmatobia fuliginosa occasionally at gas lamps, Diaphora mendica not common, D. lubricipeda very common, Hepialus humuli in swarms, H. sylvanus common, Zeuzera aesculi one only, Porthesia similis (auriflua) common, Psilura monacha one only (actually in Bridport Town itself), Pericallia

syringaria fairly common, Epione apiciaria and Amphidasis strataria

(prodromaria) as fairly common also.

Bottom Hill.—This is a hill about 400 feet high, close to Bridport on the East, it is Inferior Oolite with a sandy wood at the top with a good many fir trees in it. This sandy soil I have referred to before. Pararge megera, Pieris napi, P. rapae and P. brassicae were common. Polyommatus icarus less so. Rumicia phlaeas and Euclidia mi were both present, as was Xanthorhoë (Melanippe) sociata. I picked up a single 2 Diaphora mendica. Mr. Webber records Gnophria rubricollis as common amongst the fir trees. I, however, did not see it, and he also records Bithys (Zephyrus) quercûs at the foot of the hill.

West Bay.—A low cap of Middle Lias, to the west of this town, produced to me many *Polyommatus icarus*, including a few good ab.

caerulea. Mrs. Hudson was here from August 11th to September 10th, 1917, and I have set her captures and examined them. Aglais urticae was abundant, and included ab. nubilata, Raynor, and ab. radiata, Raynor. Pyrameis atalanta was also extremely plentiful. Vanessa io was not uncommon. Epinephele tithonus was abundant but worn, the second or third broad of Pararue meyera was getting worn but was much in evidence, a single P. aeyeria var. eyerides, very ragged was obtained, but the exact site of capture is a little uncertain, which is a pity in view of the fact that I never met with the first brood off the Oolite. Epinephele jurtina (ianira) was worn to rags. Coenonympha pamphilus was very abundant. Colias edusa was seen in a clover field on the west side of the Brit, and Mrs. Hudson captured three 2 s on September 6th, 1917, she also saw them on the cliff between Eype and West Bay, but estimates that she saw about 30 specimens altogether. Polyommatus icarus second brood was going over. I noticed that Mrs. Hudson's catch contained very few ab. icarinus, and far less tendency to ab. caerulea than my captures of the first brood, and curiously in contrast to my wife's experience at Poole, where on two days she worked assiduously at the second brood and caught a good number of fine ab. caerulea and a fair number of underside variations. Mrs. Hudson's only underside variation was an asymmetrical 3, in which the dorsal spots on one of the hindwings were conjoined to form a streak. Rumicia phlaeas second brood was abundant, but going over. Pieris navi and P. ranae second broods were also fairly in evidence. Hudson's captures of Heterocera were one each of Hydroecia paludis, Noctua rubi, Bryophila perla, and Xanthorhoë (Melanippe) rivata, and many Crambus selasellus.

EYPE.—A small seaside village about two miles south-west of Bridport; it is charted as standing on Middle Lias, which is I think only correct in part, the major part of the surface rocks and the cutting in the roadway to Bridport looked much more like Inferior Oolite. In this cutting there was always a single specimen of P. aegeria var. egerides, but never more. I caught one every time I passed through. I also disturbed Euplevia lucipara out of the herbage. Pieris napi, P. rapae, and P. brassicae also occurred, as well as Pararge megera and Polyommatus icarus, including ab. icarinus. Hipocrita jacobaeae was common, and I picked up eight wings belonging to two Arctia villica, evidently destroyed by a bird. Hesperia (Syricthus) malvae was common on the beach sitting on damp seaweed; probably this was due to

the extreme heat in June. Mr. Male records Nisoniades tages, Colias edusa and var. helice (1917), and C. hyale for this locality.

THORNCOME BEACON AND EXPE DOWN.—Thorncombe is a 590 foot eminence, rising sheer from the beach, with a tiny capping of Greensand, and terminates Eype Down, which is entrenched. There is a huge beacon pile on the top, which afforded in June shelter to a number of Pyrameis atalanta and P. cardui. I only obtained Xanthorhoë sociata, Aglais urticae, Coenonympha pamphilus, Aspilates ochrearia (citraria) here, but Mr. Male records Brenthis euphrosyne and Callophrys rubi, and Mr. Webber adds Argynnis aglaia, A. paphia, Aphantopus hyperantus and Theretra porcellus, rather scarce.

Localities I did not visit. (M = W. W. Male; W = A. E. Webber.) POWERSTOCK COMMON.—The following species are recorded:— Leptosia sinapis (olim M), Brenthis euphrosyne (M & W), B. selene (M & W), Argynnis aglaia (W), Melitaea aurinia (olim M), Aphantopus hyperantus (W), Satyrus semele (W), Melanargia galathea common but local (W), Bithys (Zephyrus) quercus (W), Callophrys rubi (W), Hesperia (Syricthus) malvae (M), Nisoniades tages (M), Hamearis lucina (M), Taeniocampa miniosa, common in 1903 and 1911 (M), Trichiura crataegi (M), and Adela viridella (M).

Eggardon.—Argynnis aglaia (M), Melanargia galathea (M), Agriades

thetis (adonis) (M & W), and Agriades coridon (W).

MAIDEN NEWTON.—Aphantopus hyperantus (W), Agriades coridon

(M), and A. thetis (adonis) (W & M).

Boar's Barrow NEAR LODERS.—Brenthis selene and B. euphrosyne

(W).

Salway Ash.—Euvanessa antiopa, seen in 1882, but not captured [Note.—I have since met the actual person who saw this insect. He is a collector perfectly clear as to what he saw.—W.P.C.]

Burton Bradstock.—Agriades thetis (adonis), August 21st, 1906

BOTHENHAMPTON AND BURTON QUARRIES .- I saw this locality but did not visit it. It is the rough spoil heaps of quarries, where the Great Oolite was formerly (?) worked. Mr. Webber and Mrs. Hudson both record Aricia medon (astrarche), not uncommonly amongst the old quarries.

Seatown.—Melanargia galathea (M), and Satyrus semele (M).

GOLDEN CAP.—Satyrus semele (M), and a single Agriades coridon, on August 3rd, 1907. Mr. Male remarks in his diary, "The first I have met with here, and no chalk near." The nearest approach to Chalk is Greensand, which caps Golden Cap, though I think the capping requires detailed examination by a geological expert, as the hill at the present time is heather and fir tree covered, and I surmise that it is probable that it is Greensand overlaid with Chalk and covered with It is nearly 700 feet high, and this would, in comparison with Thorncombe just opposite, give about 130 feet thickness to the Greensand, an excessive allowance if the top is plain Greensand.

CHARMOUTH, which I have visited occasionally, is so near to Bridport that I will include a few notes on it. Aryynnis aglaia, Bithys (Zephyrus) quercûs, Angerona prunaria (W), Vanessa io, Hepialus humuli, Sesia (Macroglossa) stellatarum (E. H. Curtis), a single specimen of Nascia cilialis in the reeds in a "weep" on the cliff, not captured, as I was geologizing, and by the time my brother had responded to my frantic shouts and climbed the cliff with net and boxes, the little beast, after sitting within two feet of my face for quite ten minutes, dived into the reeds. I was quite mortified at its loss, because it was precisely the last insect I expected to see there, but I could not mistake an insect I was so familiar with in broad daylight, within a few feet of me, that gave me time for leisurely examination, June 24th, 1911.

LYME REGIS.—Aricia medon (astrarche) plentiful (W & M).

This sums up all the information, outside Dale's Lepidoptera of Dorset, that I have been able to get together. Personally I think it is enough to make one long for more, and I wish a kindly fate would decree me three years leisure in three good seasons, with an unlimited supply of maps, petrol, and money, to explore the district thoroughly. I believe that the result would be astonishing, and any way the country is some of the most charming in Britain, in its variety of level, of strata, and hence of plants and general character.

OTES ON COLLECTING, Etc.

The Season's Notes.—Bournemouth. Bees are out. Diacrisia sannio (russula) larvæ are feeding and so are larvæ of Arctia villica.—W. Parkinson Curtis (F.E.S.), Parkstone. February 4th, 1918.

Bournemouth. Hibernia leucophaearia, Phigalia pedaria and Tortricodes tortricella (hyemana) are all out and flying about.—In. Feb-

ruary 26th, 1918.

Sherwood Forest. Hibernia leucophaearia and Phiyalia pedaria are already common this season. — William Daws, Mansfield, Notts.

February, 1918.

Some Field Notes for 1916-17.—Owing to the strenuous times in which we live my opportunities for collecting and observation have been very much curtailed, but such opportunities as I have had have been very much appreciated, if only for the opportunity afforded of taking one's mind off the war for a time. The winter of 1915-16 was very mild, and my first observation was of a queen wasp walking on the path, at South Norwood, Surrey, on January 4th, 1916, enjoying

the brilliant sunshine and mild temperature.

On January 11th I saw a & Hibernia leucophaearia on an oak trunk at Midhurst, Sussex, and some honeysuckle in leaf. On April 25th I saw my first Pieris rapae, at East Dulwich, and on the 27th Celastrina argiolus was flying at Croydon. The following day I had a female of the same species emerge in my cage from pupe I collected at Christchurch, Hants, the previous autumn. On April 29th, at Edenbridge, Kent, wasps were plentiful and busily engaged gnawing at oak palings, while "bluebottles" were sunning on the trunks after hibernation. I mention the latter, because I read an article in the Illustrated London News, about a year ago, in which it was suggested that observations were needed to find out whether the house fly and bluebottle fly hibernated through the winter as an imago.

Surely there can be no doubt about the bluebottle hibernating as an imago, as I have frequently come across it on a warm day in the depth of winter, both inside and outside the house, and the chipped wings and dusty condition of the insect showed that it was not freshly emerged.

On May 18th, at Dorking, the only insects seen were some Euchloë cardamines, flying along the edge of a wood, and C. argiolus round

laurels and ivy, while *P. rapae* and *P. brassicae* were everywhere to be seen. At Bexley, on May 30th, I photographed a pair of Tree Creepers who were feeding their young on *Cheimatobia brumata* larvæ. The feature of the spring of 1916 was the great damage done to oak and other trees in the south of England by the exceptional abundance of these larvæ.

On May 21st Mimas tiliae started emerging from pupe taken at East Dulwich. When returning from a walk in Romney Marsh, on May 22nd, I put up a Lapwing from eggs, and on going to the spot I found larve of Pachygastria trifolii feeding in some numbers. Some were small, while others were about two-thirds full size. This was at a spot where I had not taken them before, and although the imagines which I eventually bred from them were of the pale variety, they varied in general appearance from those I had bred from a different part of the marsh previously.

On June 2nd I found the trees at Richmond and Wimbledon stripped of their leaves by larve of *C. brumata*. It was quite noticeable a mile off, as instead of being a beautiful green the trees had a

dark red-brown appearance.

On June 16th I took two 3 Apatela (Acronicta) aceris on tree trunks in Dulwich village: and I noticed the whole of the way down the railway line from Herne Hill to Maidstone, Kent, the oak trees were stripped of their leaves by C. brumata larvæ.

On June 20th a specimen of Mimas tiliae was observed drying its wings, on a fence at East Dulwich, and on the 26th specimens of Cuspidia (A.) megacephala were seen at rest on elm trunks, while on a maple tree in my garden one Lycia hirtaria larva and some Orgyia

antiqua larvæ were feeding.

On July 3rd, at Brockenhurst, New Forest, a pair of Triaena (A.) psi were observed at rest on a fir trunk. A colony of Plebeius aegon were found at rest on a heath, the majority were resting head downward, some were resting with their wings parallel with the ground, while seven were resting head upward, these latter were all more or less worn. Plebeius aegon seemed more lively than Polyommatus icarus, as when about to be pillboxed they jerked themselves off the heather stem and wormed their way through the branches to the ground, whereas P. icarus seemed quite lethargic, and in some cases walked slowly into the box. Coenonympha pamphilus were observed resting head upward, and a few Ematurya atomaria 2s were also resting on the heather. Metrocampa margaritaria was found at rest on a tree trunk, and at dusk two Hepialus hectus were flying around in circles on the road, evidently a 3 and 2 courting.

The \circ Triaena psi, taken from the tree trunk on July 3rd, laid ova in a pillbox on the 9th, of a pale cream colour, which did not change until the 18th, when they developed a purple spot, and hatched on that

day.

On July 15th I went to Eastbourne for five weeks, where I had the pleasure of the company of Mr. E. P. Sharp on most of my outings, which were mainly devoted to insect photography. On the 16th, at Abbott's Wood, the following were found on tree trunks:—Moma orion \mathfrak{P} , Apatela aceris \mathfrak{P} , Amoebe viridaria (pectinitaria), Hydriomena furcata (elutata) \mathfrak{P} , and Cleora viminalis, also a full fed larva and two pupe of Psilura monacha, the latter attached by a small web to the

trunk, a cocoon of Euproctis (Liparis) similis (auriflua) and a larva just spinning up. Another cocoon of E. similis (auriflua) was found, which was full of the cocoons of an ichneumon fly, Microgaster connexus, which emerged in August. A pretty little grey orb-weaving spider (Meta merianoë), was also found sitting on its cocoon of eggs, on a willow trunk, where it remained for some weeks. Epinephete jurtina and Aphantopus hyperantus 3 s were in fair numbers, but only one 3

Polyommatus icarus was seen, and one & Dryas paphia. On July 19th I visited a colony of Euproctis (P.) chrysorrhoea at Beachy Head, and found the clump of blackthorns eaten bare of leaves, exposing to view a large number of winter hibernating nests. I was not surprised at this, as when I visited the spot on July 7th, 1915, the bushes and elder trees were nothing but a mass of cocoons, and the imagines were emerging everywhere and drying their wings, while others were busily laying their ova on blackthorn leaves and branches, nettles and elder leaves. Later it was quite easy to find the batches of fur-covered ova by the dozen, and it was obvious that if all the ova hatched the larvæ would be starved in the following season. The imagines were fine large insects, and some 3 s and 2 s had the black spots which are occasionally to be found on their otherwise white wings, very well developed. To return to 1916, it was only too obvious that after the bushes had been eaten bare starvation had followed, as was the case at Newhaven, which I recorded some years ago. On one or two of the winter hibernating nests I saw half fed larvæ resting, and in a very weak state. On a later visit I found some imagines emerged, very undersized, and a number killed by spiders and wound round with

On July 21st a specimen of Aglais urticae was sunning on a watered road, and at Abbot's Wood Cymatophora duplaris, rather worn, was found at rest on a willow trunk, also a pupa of P. monacha and two cocoons of Cerura furcula. A banded specimen of Ptychopoda aversata was at rest on a leaf, and a freshly emerged & E. similis (auriflua) resting on an oak trunk.

On July 23rd, at Abbott's Wood, a freshly emerged of Cleora lichenaria was at rest on an oak trunk. One Dryas paphia was seen,

but no P. icarus, and only a few E. jurtina and A. hyperantus.

On July 27th, a visit was paid to the Downs for Eremobia ochroleuça, but not one specimen was seen. Æschna grandis was hawking up and down, and a & Argynnis aglaia followed a zig-zag course along a bank covered with flowers of the greater knapweed, over which it occasionally hovered, but on which it did not settle; then it went for a flight over a field of waving corn, settling occasionally on a tall thistle in the middle of the field, then returning to the great knapweed bank. This it continued to do all the afternoon, and it had evidently made this spot its playground. On one of its trips it was attacked by an Aglais urticae, which however it ignored. Zygaena filipendulae were fully out in two colonies, and were very busily engaged in finding mates in the warm sunshine. I found a number of torn cocoons from which the pupe had been extracted by some enemy.

The season for butterflies was very late, no Melanargia galuthea were out, and I only saw one P. napi, one P. icarus, and three Agriades

coridon.

their silk.

On the 28th a visit was made to Newhaven, to see if the colony of

E. chrysorrhoea still existed, but I could find no sign of cocoons,

imagines, or winter larval nests.

On August 1st. at Abbott's Wood, three ? Psilura monacha emerged from pupe on oak trunks, between 2.30 and 4.30 p.m. (G.T.). One specimen of Cleora viminalis was found freshly emerged on a willow trunk, and three E. similis (auriflua) 3 s on oak trunks, also a fully fed larve of O. antiqua, badly ichneumoned, and a specimen of Calymnia trapezina drying its wings at 7-20 p.m. (G.T.). I saw only one P. icarus and one Celastrina argiolus, but Dryas paphia was now fairly

common.

On August 4th Pieris brassicae and P. rapae were swarming in gardens and cabbage fields, near Eastbourne and at Abbott's Wood. Bithys quercus were flying round oak and ash trees in some numbers, and sunning on the leaves out of reach. P. brassicae, P. rapae, P. napi, E. jurtina and E. tithonus were now common in the clearings in the wood, and a worn specimen of the second brood of Tephrosia bistortata was found at rest on a tree trunk, the only moth found at rest. A full fed larva of Notodonta dromedarius was taken wandering about the grass preparatory to going to earth to pupate.

On August 11th the first Pachygastria trifolii (Romney Marsh), a β , emerged at 1.30 p.m. (G.T.), a $\hat{\gamma}$ emerged between 2.0 and 5.0 p.m. (G.T.), and a second β emerged at 7.15 p.m. (G.T.). I went to Beachy Head and took one larva of Theretra porcellus, about $1\frac{1}{4}$ long, on yellow bedstraw. Polyommatus icarus was now out in profusion, and Agriades coridon was also flying in some numbers; a few freshly emerged Zygaena filipendulae were resting on greater knapweed heads.

On August 13th the last E. chrysorrhoea, a \Im , emerged, and a $Cleora\ lichenaria\ larva$, taken a month before, and which had turned out an ichneumon larva, still lingered on, while a \Im $Arctia\ caja$, which emerged on July 15th, was still very much alive. P. trifolii continued to emerge, and my last specimen, a \Im , came out on August 28th. At Abbott's Wood Mr. E. P. Sharp found a specimen of $Cerura\ furcula$ emerged and drying its wings at 3.30 p.m. (G.T.), on a willow trunk, where he had previously found the cocoon.

On August 15th an attempt to assemble *P. trifolii* \$\mathcal{Z}\$ s, at Eastbourne proved a failure, although we had been successful in other years. It appeared to be excellent weather, with a soft S.W. wind. A full fed larva and a pupa of *Dianthoecia carpophaga* were taken, also several empty cocoons of an ichneumon fly (*Ophion luteus*) which preys on the

larvæ of the first brood.

On August 17th I counted 35 specimens of Microgaster connexus, which had emerged from an E. similis (auriflua) cocoon. A visit to Beachy Head produced another larva of T. porcellus from yellow bedstraw, and a number of larva of Hecatera serena feeding on the flowers and buds of the hawkweed, in brilliant sunshine.

On August 19th I returned home. During my stay at Eastbourne

I did not see a single specimen of Colias edusa or Pyrameis cardui. (To be continued.)—C. W. COLTHRUP.

NOTES AND SHORT NOTICES. **EXURRENT**

A writer in the Globe a few weeks ago, writing on the topic "Dig! Dig!! Dig!!!," after eulogising the virtues of this now so necessary newly self-imposed task, turns to the fascination of discoveries to be made on the natural history side. After discussing the incidents connected with the spade dropping into a wasp's nest from which a pair of garden mice scuttle out he proceeds as follows-" Then on you go and bring to light an uncommon butterfly paupa. A minute examination and a reference to a book tells you it is a paupa of the peacock butterfly. Then up come all sorts of grubs or catterpillars, uninteresting and harmful varieties, and what a feast the waiting robins have." and so on to the "battered penny" and the digger "as pleased as Punch." Our correspondent's marginal note to the extract "Evidently in formá pauperis" no doubt is intended to be caustically

In the Naturalist for December still other Agrius convolvuli are reported to have turned up in the North. The advent of this and other large moths is often attended with remarkable incidents. Mr. W. J. Clarke says, "I was attending the funeral of an old friend at the cemetery, and an old lady in the company suddenly made a furious onslaught with her umbrella upon some object in the grass. Presently one of the grave-diggers went to her help, and assisted in hammering with his spade the object of her attentions. After the funeral was over I went to the spot to see what they had been killing, expecting to find a frog or a toad, but instead I found the battered remains of a Convolvulus Hawk Moth. The grave-digger was standing by, and when I stooped to pick it up he hastily exclaimed, "Deaen't touch it, it's a hoss-teng." I had some difficulty in persuading the man that the object of his attentions was after all but a harmless moth." Mr. Clark goes on to give an incident which is too good not to be repeated. Death's Head Moth had flown upon the deck of a Scarborough fishing hoat while out at sea. The crew viewed the intruder with great dread, and turned the hose on it, washing it into a corner, where, half dead, it was transfixed to the deck by a daring member of the crew, armed with a hammer and big wire nail. To make it additionally secure a fish box was turned over it, and so it arrived in port, where I saw it shortly afterwards, still alive in spite of its ill-usage."

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

November 8th.—Decease of a Member.—The decease of a lifemember, Mr. R. Standen (1873), was announced.

ABERRATIONS OF BRITISH LEUCANHOÆ.—Mr. Leeds exhibited forms and aberrations of various British Leucaniidae, including Leucania impura, with ab. punctina, etc.; L. pallens, with ab. ectypa, ab. arcuata, etc.; L. phragmitidis, with ab. rufescens, etc.; Coenobia rufa; Tapinostola fulva; Nonagria geminipuncta, with ab. unipuncta, ab. obsoleta, etc.: N. dissoluta; N. brevilinea, with ab. sinelinea, etc.

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A SMALL RACE OF A. MEDON.—Mr. A. W. Buckstone, a series of a small race of *Aricia medon (astrarche)* from Wendover, May 1912, with Surrey series for comparison.

PIERIDS WHICH EMIT SCENTS.—Mr. Edwards, a number of species of *Pieridae*, and referred to the different odours which were emitted by

the specialised scales in many species.

Local races of A. Crameri (Belia).—Mr. Turner, examples of the Pierid Anthocharis crameri (belia) from some twenty localities and referred to the local and seasonal forms.

November 22nd, 1917.—Mr. Bowman exhibited several series of Hemerophila abruptaria bred in 1916 and 1917, spring and summer emergences, and gave details of the results, a wild typical male having been paired up each time with a melanic bred female.

Mr. Brooks, a fine aberration of Lomaspilis marginata, the dark markings confined to the costal area, almost ab. pollutaria, from

Wicken, in 1910.

Mr. Edwards, a series of Papilio nireus, and pointed out variation

in the underside markings.

Mr. B. Adkin, three aberrations of Agriades coridon, (1) ab. suavis, with red scales in margin of hindwing above; (2) ab. semi-syngrapha,

both from Sussex; and (3) ab. syngrapha from Surrey.

Mr. Hy. J. Turner, a series of the Satyrid, Satyrus statilinus, with its S. European larger form, var. allionia, and the very large race from Sicily, var. martiani; they were from various localities, from Spain to Asia Minor.

Mr. Ashdown, a dark form of Lophopteryx camelina, and a dwarf pale form from Oxshott, with Pheosia dictaeoides and Himera pennaria

from Wimbledon.

Mr. Newman, a living Amorpha populi, bred Nov. 21st, in a cold greenhouse.

December 13th.—Annual Exhibition.—Mr. R. Adkin exhibited a Pieris brassicae with the apical blotches of the forewings crossed by distinct yellow streaks on the veins.

Mr. W. G. Sheldon, about 600 Peronea cristana and its various forms and his long series of Leptogramma literana in great variety.

Mr. B. Adkin, a cabinet drawer of Noctua primulae (festiva), and

one of Dianthoecia carpophaga.

The Rev. J. E. Tarbat, a *Pieris napi* having two small white patches centred with black on the underside of the right hindwing, and a *Mimas tiliae* without the central band on the right forewing.

Mr. W. J. Ashdown, a varied series of *Ematurga atomaria*, including a very dark almost uniform male, and a very white ground female deficient in two inner transverse lines on the hindwings.

Mr. Prideaux, living larvæ of Pararge megera, and read notes on the

oviposition habits of the species.

Mr. West, on behalf of the Society, several drawers of the "Free-

man" collection of European butterflies.

Mr. Bowman, specimens of Cosymbria pendularia, including various forms of the ab. nigro-subroseata: dark marginal bands narrow; white transverse lines extra well defined; all four wings purple; white lines wholly missing; and striated. Also Tiliacea (Xanthia) aurago with reddish forms, from Horsley.

Mr. Brooks, series of T. (X.) aurago from Horsley, and representatives of various local races of Ematurga atomaria.

Mr. Hammond, a perfectly symmetrical gynandromorph of Poly-

ommatus icarus from Boscastle.

Mr. Newman, for Mr. G. B. Oliver, a very long series of picked aberrations of Agriades coridon taken in 1917, including many aberrations of var. syngrapha, forms of ab. semi-syngrapha, a gynandrous specimen, various colour aberrations, a series showing variation to var. fowleri, underside aberrations, etc.

Mr. Tonge, a bred series of Ennomos quercinaria (angularia), half being dark banded; males of A. coridon showing red scales on the margin of the hindwings, and an example of ab. fowleri from Surrey; and the Dipteron Echinomyia grossa, bred from a larva of Lasiocampa quercus var. callunae from near Preston.

Mr. A. Lawrence, a rare aberration of the female of the Australian race of *Hypolimnas bolina* from Rockhampton, an almost uniformly

black specimen.

Mr. L. W. Newman, long series of aberrations of Abraxas grossulariata, including forms of ab. varleyata, of ab. lacticolor, and of ab. nigrosparsata, etc., long series of Cosmotriche potatoria from W. Sussex, many females approaching the rich dark males in coloration; a long series of hybrid ocellatus × populi, bred 1917, very uniform in marking, most were gynandromorphs; a number of brick-red Mimas tiliae; bred series of Boarmia roboraria, extremely small although well fed; an extreme melanic Boarmia consortaria from Sutton Coldfield; large female Cerura bicuspis, bred from Tilgate Forest; and black-banded Agriopis aprilina, bred from pupe dug in Delamere Forest.

Mr. W. J. Kaye, Morpho perseus from French Guiana, a polymorphic species spread over a considerable area of S. America; and a

painting of the Byfleet Canal.

Mr. Hy. J. Turner, butterflies recently received from Sicily, including Charaxes jasius, Gonepteryx cleopatra, Polygonia egea, Papilio podalirius, Rumicia phlaeas var. eleus, Pieris manni (?), a very dwarf Aricia medon, etc., and read notes on the exhibit.

Mr. E. M. Gibb, salmon coloured examples of Zygaena filipendulae

from East Sussex.

Mr. H. A. Leeds, a large number of aberrations of British butterflies taken in 1917, including Agriades coridon, pale \mathcal{S} , ab. semisyngrapha, varied ground in \mathfrak{P} s, ab. syngrapha (Chiltern Hills), dwarf \mathfrak{P} ; Polyommatus icarus ab. icarinus, underside aberrations; Euchloë cardamines; Pieris napi, large black markings on forewings; Melanargia galathea, much yellow developed; Coenonympha pamphilus, varied ground, ab. lyllus, etc.

Mr. H. Moore, Euvanessa antiopa and Pyrameis cardui, examples from numerous localities over the whole of their areas of distribution.

Mr. A. W. Buckstone, a series of *Spilosoma lubricipeda* var. fasciata, the result of inbreeding a cross between type and zatima; and bleached forms of *Epinephele jurtina*.

Mr. O. J. Williamson, photographs of the nest and nesting habits

of the Great Crested Grebe.

Lancashire and Cheshire Entomological Society.

October 15th, 1917.—Exhibition of the Season's Captures.—

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According to custom the first meeting of the session was devoted to exhibits of the last season's work; this year, as all the younger members were away on military service, there was not such an extensive display as usual; still some interesting insects were brought forward. Mr. F. N. Pierce exhibited specimens of the true Eupoccilia luridana, Gregson, captured this year by the Rev. John W. Metcalfe, in Gloucestershire, which recent investigation had proved to be a good species and entirely distinct from the manniana of Fischer von Roeslerstamm. Mr. Pierce also exhibited a long series of Epiblema solandriana from the collections of Messrs. W. Mansbridge, H. C. Hayward of Derby, and John Gardner, along with the wing-parts of a number of test specimens sent to him for the purpose of proving by the genitalia that the form sinuana, Hub., was a distinct species. A discussion ensued regarding the latter part of the exhibit, in the course of which Mr. W. Mansbridge stated as his opinion that much further evidence was needed before it could be conclusively proved that sinuana, Hub., was not a variation of solandriana. Mr. Brown showed preparations of the gallfly, Cynips kollari, bred from the oak marble gall, and contributed notes. Mr. S. P. Doudney, a nice collection of Lepidoptera from various localities, including, from Aberdovey, two xanthic aberrations of Eninephele jurtina (janira), series of Argynnis aglaia, A. cydippe (adippe), Bithys (Thecla) quercus, a specimen of Xanthorhoë (Melanippe) unanqulata, etc. From Witherslack and Grange:—Brenthis euphrosyne, Celastrina argiolus, Nisoniades tages, Hamearis lucina, and a series of Banta taminata, taken in Eggerslack Wood, Grange, being the first Lancashire record for many years. Mr. J. W. Griffin brought the results of his work from the Wallasey district during the summer; the exhibit comprised some 70 species, many of them in bred series, the most interesting being as follows:—A specimen of Agrius convolvuli, Cerura furcula, Notodonta dictaea, Dasychira fascelina, Macrothylacia rubi, a fine bred series, Acronicta leporina, and a series of Pharetra (A.) megacephala, containing some fine dark examples; he reported that the larva of this last moth has been very common in some of the Lancashire towns this summer; Agrotis ripae, three specimens, this has never before been reported from Wallasey; a single specimen of Cleoceris viminalis. also a new record for Wallasey, Plusia festucae, Mesotype virgata, and Nyssia zonaria, both the last had been commoner on the Cheshire sandhills than for many years past. Mr. W. A. Tyerman also had nice series of M. virgata and N. zonaria, a very pretty yariety of Rumicia phlaeas from Woolton, near Liverpool, which had the red marginal band of the hindwings broken up into narrow red streaks; a male Bryophila perla with strong rosy ground colour, from Cronton, and a fine banded form of Carsia paludata, from Simonswood. Mansbridge exhibited bred series of Malenydris (Larentia) salicata. Ochyria (Coremia) unidentaria, both red and black-banded forms, and Numeria pulveraria, second brood, from Witherslack; a varied series of Thera obeliscata from Silverdale; also a number of species of Lepidoptera from Delamere Forest, which included a nice intermediate variety of Amphidasis betularia and a fine lot of Evetria (Retinia) buoliana, from the young pine plantations in the forest, where they appeared to be doing a great amount of damage to the young trees.

REVIEWS AND NOTICES OF BOOKS.

RIVISIONE DELLE SYNTOMIS PALEARTICHE A DOPPIO CINGOLO GIALLO, E SAGGIO DI UNA CLASSIFICAZIONE DELLE VARIE SPECIE E FORME. (Revision of the Palæarctic Syntomis with double yellow girdle, and an attempt at the Classification of the various Species and Forms). With seven plates. By Conte Emilio Turati.—Count Emilio Turati has been doing interesting and useful work in reviewing the Palæarctic species of the Syntomis group. He has illustrated his monograph with seven plates, containing 76 figures of the moths' wings and 19 of the different organs of the & genitalia. The latter are very instructive so far as they go, the former rather less so. When we look through a long series of Syntomis phegea we are immediately struck by the irregularities in size and form and the varying markings on the wings. Between phegea ab. fenestrata ? - nearly entirely white-and phegea ab. iphimedia—without a single white spot—there is an uninterrupted scale of intermediate forms, for very many of which names may be hunted out if required. Now plate I. gives us figs. of sixteen forms of S. phegea and five of Turati's new species S. aequipuncta, four of which latter resemble one another so closely that they almost may be said to sin against the law of Syntomid variability. Now we must confess that we find these figures very unconvincing. We have taken many uncontestable pheyea in Northern Italy that are spotted exactly as aequipuncta is spotted. Feeling unconvinced we turn to the male genitalia and find a single fig. of aequipuncta with nothing distinctive about it save the uncus, and only one pheyea with which to compare it. In a certain number of genitalia of phegea that we have examined we have noted that the uncus is not very constant in form, and the aequipuncta here figured might not impossibly be taken for a phegea; we should suggest then that several other figs. of this moth's genitalia should be given together with an equal number of the organs of phegea similarly exposed. From the text we should deduce that aequipuncta runs the risk of being confounded with mariana, Staudinger (or mariana, Turati spells it both ways), but this view is not supported by the figures either of the wings or of the genital organs. S. nagazzi, Tti., another newly described species from the South of Italy, is satisfactorily differentiated from marandica and cocandica, with which there is small danger of confounding it, but far less so from our old friend phegea; here again we should like to be able to consult a series of figures.

Turati explains at some length the impossibility of cocandica being found on the Jura range, and tells us that two specimens in the British Museum make this false claim of having been captured in Switzerland. I happened to call on Dr. Chapman a few hours after he had received a letter from the Count asking for his opinion on the veracity of these two moths, and I suggested to him that Turati, or his authorities, had probably read Jura for Tura, and this indeed proves to be the case.

The Syntomis wings have been described very carefully, and Turati makes it easy for a collector to determine the varietal or aberrational name of any of these moths about whose nomenclature he may feel uncertain. We cannot but regret that more space and time were not given to other and more convincing ways of differentiating species. In a word, if we are sure of our species, Turati's very complete tables will at a glance tell us the name of the insect we are examining; but if we

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are to differentiate species, the wing-spotting of which overlaps one another, we shall require more figures of the genitalia, and we sincerely hope that Count Turati will give them to us.—P. A. H. Muschamp.

[I am glad to see Mr. Muschamp's review of Count Emilio Turati's "Revision," which through the kindness of the Count has been on my table for some time, and which I had already seen was open to some

friendly criticism.

First of all I would draw the attention of our readers to the nomenclature. In February, 1916, I went carefully into the question of the synonymy of Syntomis, as also of Zygaena and Adscita, and I think I proved there (Ent. Record, vol. xxviii., p. 25) that Syntomis must fall to the genus Amata, Fabricius. Fabricius himself revised his genus Zygaena, wherein till that time phegea had been placed, and created Amata for passalis and cerbera, leaving phegea under Zygaena-the details are given in my other paper. This action was so definite that we have no option but to accept Amata with the type as passalis; phegea is con-generic with passalis, and therefore Ochsenheimer's genus Syntomis-made for pheyea-must sink as a synonym to it. We can of course use the word Syntomidae for the group, though personally I should like to see it dropped for Amatidae. I should add that since my note in 1916, so conservative a worker as Hampson has accepted the genus Amata in place of Syntomis. There is another point I should like to give a serious warning on, the genitalia of the genus. Muschamp has drawn attention to this point in the cases of aequipuncta versus phegea, but he refers to the uncus only. I would, however, go further, the genitalia are normally, I believe, subject to constant asymmetry in many parts. I will mention two, the organ that represents the "furca" is I believe always asymmetrical and most variable; and the clasps are the same. I have no preparation with the clasps like figure 1 on plate vi. of the Count's paper, and in all my "mounts" the two clasps differ from each other both in size and shape and when compared "inter se." The uncus agrees generally with the figure there given, but only "generally," the size and length and stoutness vary much.

It might be interesting to draw attention to the furca in Amata, this organ rises from the rear of the clasps and forms a sort of open cone-shaped tunnel between the clasps, whilst ascending in the rear are two sclerites, which project forward in two more or less long arms over the clasps, these arms being always I believe of different lengths. The same principle without the asymmetry occurs in several other groups of the Heterocera, and in the Rhopalocera a somewhat similar type of

organ exists throughout the Chrysophanidae.

I think we are indebted to the Count for his very interesting paper, and the illustrations will make it all the more valuable, but I feel that the genitalia are not a safe guide for us in this group, unless a very large number were available for comparison.—G.T.B-B.]

BITUARY.

The Rev. Frank E. Lowe, M.A., F.E.S.

To his many friends the news of the death of the Rev. F. E. Lowe, will come with something of a shock, for though he has been out of health since last autumn, and his more intimate friends were aware that no hope was entertained of his ultimate recovery, yet the end

came with unexpected swiftness. On February 11th he was taking part in the funeral of Dr. Aikman, and on the 21st his own call came, so that he has died "in harness," as he himself would certainly have wished. Born in 1854, he entered the University of Durham as a scholar in 1872, becoming Grieve Exhibitioner the following year, and taking his B.A. in 1875, L.Th. in 1876, and M.A. in 1879. He was ordained in 1877 to the Curacy of St. Paul's, Burton-on-Trent, where he remained till 1880, when he entered on his long incumbency of St. Stephen's, Guernsey, first as Curate-in-charge and from 1885, when it became a separate parish, as Vicar. This is not the place to speak of his clerical activities, which were both strenuous and successful, and we must content ourselves with the statement that he will be most sorely missed in the Church life of the island, and above all in the parish, where for nearly 38 years he had been so much loved and

respected.

But it was not only in Guernsey that he won admiration and affection; there are not many people whose company on an entomological expedition, and even more whose companionship in a hotel gave to their friends more sincere delight; it was always felt that if Mr. Lowe was going to be there we should have "a good time." He married young, in 1878, and Mrs. Lowe was (and is) also an enthusiastic entomologist and a notable wielder of the net. Many a delightful day have my wife, her sister, and I spent in their company in various parts of Switzerland, more especially in the Rhone valley and on the Simplon Pass. We first met at Sépey in 1897, and have thus enjoyed over twenty years of unbroken friendship. Mr. Lowe became a Fellow of the Entomological Society in 1894, and though his distant home precluded all possibility of regular attendance, he generally contrived to arrange his occasional visits to London in such a way as to attend one of the Society's meetings. His first contribution to this magazine was in 1897, his last in December, 1917, and between those dates it was indeed rarely that his name failed to appear in the "List of Contributors." In addition to many interesting notes on the entomology of his island home, his expeditions in France, Spain, Germany, N. Italy, the Tyrol, and various parts of Switzerland have been chronicled for us in his own cheerful and breezy style, and his writings seem to embody much of his sunny character. His keen sense of humour, his imperturbable good temper and readiness to make the best of a situation are, for instance, all unconsciously portrayed in his account (vol. xiv., p. 330) of his capture as a spy at Neu Breisach, in 1902. He also wrote for many years in the "Entomologist" to which he contributed notes and occasionally longer articles. beginning as far back as 1883, his last note being in November, 1917. For entomologists his name is enshrined in the name of Dianthoecia (Luperina) luteago var. lowei, Tutt, which he discovered, and in the Chrysophanid genus Loweia, Tutt, to which such well-known forms as dorilis, alciphron, gordius and amphidamas belong.

Mr. Lowe leaves a widow and one daughter, who is married to the Rev. Charles Lucas, Rector of Kettering, with whom all his friends will

feel the deepest sympathy.—G.W.

Correction.—Page 25, lines 19 and 21 for "Triscotia" read "Triscolia."

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Duplicates.—Euphrosyne, Selene, Blandina, Hyperanthus, Davus, Corydon, Ægon, Asiliformis, P. populi, Mundana, Russula, Moneta, Iota, Pulchrina, Festucæ, Lupulinus, Hecta, Ericetaria, Leucophæaria, Strigillaria, Didymata, Fumata, Muricata, Albulata, Imbutata, Atrata. Desiderata.—Pictaria, Notata, Brunneata, Blomeri, Rubricata, Rusticata, Straminata, Subsericeata, Blandiata, Lobulata, Munitata, Quadrifasciaria, Fluviata, black pairs only.—James Douglas, Thorncote, Chellaston, nr. Derby.

Duplicates.—*Dissimilis, Velleda, Fibrosa, *Ambigua, Fulva, *Lubricipeda var. Fasciata, *Plantaginis, Coracina, Captiuncula, Mundana, Lutosa, Togata, *Valerianata, Gilialis, Inquinatellus, Caledoniana, Variegana vars. Sauciana, Geminana, Cinerana, Brunnichiana, Schulziana, Congelatella, Occultana, Vectisana, Dorsana, Rusticana, *Suboccelana, *Strobilella, Nanana, Herbosana, Petiverella, T. corticella, *Œcop, Fulvigutella, etc. Desiderata.—Good Pyrales, Tortrices, etc.—T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough.

Duplicates.—East African butterflies wanted, butterflies of any country except species occurring in Britain.—W. Feather, Kibwezi British East Africa.

Desiderata.—Pieris napi—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; Pararge ægeria from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—G. T. Bethune-Baker, 19, Clarendon Road, Edgbaston.

Duplicates.—Machaon*, Sinapis, Edusa, Hyale, Valezina, Artemis*, Cinxia, Athalia, C-album*, Polychloros*, Sibylla*, Cassiope, Blandina, Davus, Betulæ*, Artaxerxes, Arion, Actæon, Galii*, Scoliæformis*, Minos, Exulans, Meliloti, Albulalis, Helveola*, Quadra*, Cribrum, Hera*, Fuliginosa*, Fascelina*, Cratægi*, Callunæ*, Trifolii*, Versicolor*, Lapponaria*, Hispidaria, Glabraria*, Abietaria*, Obfuscata, Trepidaria*, Smaragdaria*, Orbicularia*, Auroria, Fumata, Pictaria*, Alternata*, Carbonaria, Pinetaria, Cæsiata, Ruficinctata, Salicata, Pygmæata*, Togata*, Sexalisata, Munitata, Fluviata, Lapidata, Undulata, Reticulata, Nubeculosa*, Chaonia*, Or, Flavicornis var. Scotica*, Ridens*, Leporina, Menyanthidis, Myricæ, Concolor, Templi, Agathina*, Conspersa, Barrettii, Occulata*, Tineta*, Glauca, Rectilinea, Peltigera, Melanopa, Cordigera, Interrogationis, Bractea, Craccæ, etc. Desiderata.—Varieties and local forms.—Arthur Horne, Bonn-na-Coille, Murtle, Aberdeenshire.

Wanted, for research purposes, during 1917, ova and larvæ of almost any species of British Lepidoptera. Offered British beetles (many scarce or local) and microscopic mounts.—Geo. B. Walsh, 166, Bede Burn Road, Jarrow-on-Tyne.

Note.—Mr. Donisthorpe will be grateful for any ants from all parts of the British Isles, with localities, unset or otherwise, for the purposes of study.—H. St. J. K. Donisthorpe, 19, Hazlewell Road, Putney, S.W.

I would be very glad to exchange Californian butterflies for English blues especially the variable \mathfrak{Z} s, and the blue \mathfrak{Z} s of coridon such as have been recorded by Keynes and others.—Fordyce Grinnell, Jr., 712, East Orange Grove, Paradena, California, U.S.A.

Duplicates.—Artemis* (Cornish), Tithonus extra spotted vars., Corydon var. Semi

Syngrapha (fair only), Tilice*, Angularia* (Quercinaria), fine banded vars., Bicuspis* and many others, also Pupe Lucertula, Falcula, Tiliæ, Consortaria, Versicolor, etc. Desiderata. Perfect only Cardanimes & s., Cardui, Iris, Ocellatas, B., quercus, Chloram, Ligniperda, Humuli, Convolvuli, and many others. Also Pupe Carpini, Porcellus, Callumo, Dictaea, Dictaeoides, Dodonea, Vinula, S. ligustri, and many others. Liberal exchange or cash.—L. W. Newman, Bexley, Kent.

Desiderata. Euchloë cardamines from Ireland; also types of E. cardamines from Switzerland, Italy, S. France; var, turritis (S. Italy), var. volgensis, var. thibetana, and of E. gruneri, F. euphenoides, E. damone, and any palearetic species of the genus. Duplicates. Loweia dorilis and vars., a few minor vars. of E. phlaas (British), and many

British lepidoptera. Harold B. Williams, 82, Filey Avenue, Stoke Newington, N.

Duplicates. Ova: Cervimaria, Neustria. Larva: Ormata, 5 Falcula, 5 Lacertula, Caja; Pupae Pessicaria, 6 Populi. Imagines: Adonis, Corydon, Irish Napii, II. comma, Tages, Malvae, Sylvanus, 2 Tipuliformis, 8 Cypipiformis, 1 Culiciformis, 2 Bembeciformis, fair only), 6 B. quercas, 9 Carpini, Humuli 7, 13 Histaria, 7 Macilenta, 1 Papilionaria, Ormata, Gilvaria, 2 Crepuscularua, cervinaria, 4 Punctularia, 3 Palumbaria, 2 Falcula, Lumosa, Vaccinii, Spadicea, 4 Lutulenta, Cruda, Stabilis, Gothica, 6 Instabilis, Rumicis, Desiderata.—Very numerous, pupa and imagines.—F. T. Grant, 37, Old Road W., Gravesend.

Duplicates.—Cardamines § § 8, Brassica, Rhamui, Euphrosyne, Selene, Aglaia, Adippe, 10,* Galatea, Egeria, Hyperantus, Ianira, Semele, Megera, Icarus, Bellurgus, Argiolus, Lucina, Quercus, Rubi, Malva, Tages, Sylvanus, Comma, Filipendula, Trifoli, Jucobawa, * Mendica, * Russula & s., Caia*; Auriflua, * Falcula, Neustria, * Pavonia, * Flavicornis, Duplaris, Pallous, Arcuosa, Rumicis, Graminis, Gemina, Comes, * Xanthographa, * Secalis, Pisi, * Piniperda, Gothica, Cruda, Baia, Meticulosa, Rufina, Brassica, * Litura, Satellitia, Ovyacanthue var. Capucina, Vaccinii, Lithurgyria, * Incerta, Pistacina, Fulvaço, Trimagulum, Trapezina, Mi, Glyphica, Myrtilli, Parthenias, Maura, * Maeunta, Advenaria (very fair), Autummaria, * Abruptaria, Pilosaria, * Hirtaria, * Obscurata, Biundularia, Consortaria, Consonaria, * Punctulata, Pendularia, * Belgiaria, Gilvaria, Adustata, * Clatbrata, Pulveraria, * Pusaria, * Pictaria, Albalata, Multistrigaria, Fluctuda, Ocellata, Montamata, Procedlata, Albicillata, Bicolorata, Budiata, Aurantiaria, Marginata, Boreata, Dilutata, Leucophenria, Carpinata, Impluviata, Juniperata, Rufata, * Musuraria, Firmata, * Obeliscata, Pyraliata. Black pins and full data. Pupw of Jacobaw and Hispiduria. Desiderata. Local species and local forms of British Macro Lepidoptera, particularly northern. A. W. Buckstone. 307a. Kinaston Road. Mexton Park. London, S.W. 19.

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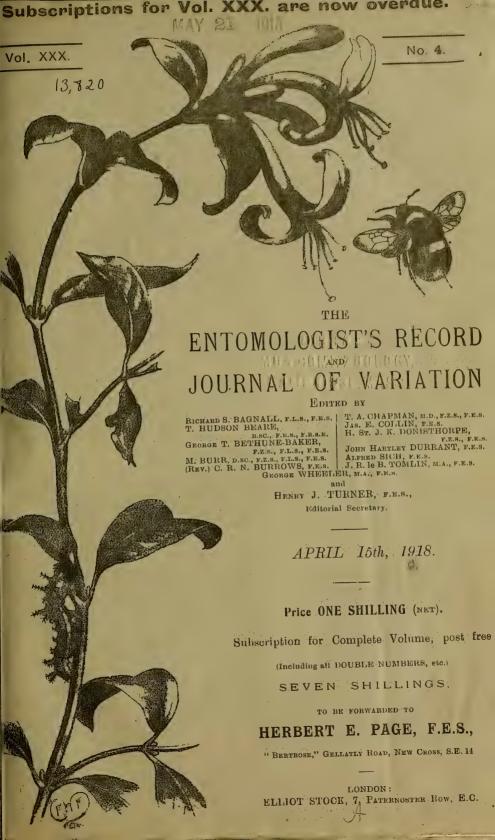
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Zygæna trifolii, Z. filipendulæ, etc.

By G. T. BETHUNE-BAKER, F.L.S., F.Z.S., F.E.S.

In the Bull. Soc. ent. France, no. 15, p. 262 et seq., M. Chas. Oberthür calls attention to the observations of Dr. Verity on Zyyaena filipendulae, Z. stoechadis, Z. angelicae, Z. lonicerae, and Z. trifolii, who considers these species merely forms or varieties of one, Z. filipendulae. M. Oberthür draws attention specially to Z. trifolii and Z. filipendulae as he finds them at Rennes. He says that Z. trifolii appears from May 25th to the end of June, and that it is of the form palustris, or of a smaller form, according to its locality being more, or less, humid. (At this time it is useless to look for Z. filipendulae.) He says Z. trifolii frequents meadows, whilst Z. filipendulae frequents the borders of paths in the woods and the edges of fields, and he says that it does not begin to emerge until July 15th, and continues till the middle of August. He then goes on to point out that Z. trifolii varies in one direction on certain lines, whilst Z. filipendulae varies on other lines in another direction, that the six-spotted Z. trifolii is not rare in its var. palustris, but is easily differentiated from Z. filipendulae, and that in his opinion they are not forms of one species, but are two distinct species at Rennes.

Readers of the Ent. Record may possibly remember that I have paid much attention to these two species, as also to Z. lonicerae, both in England and on the continent. My experience in England corresponds closely with that of the famous French observer, only that in Devonshire and on the south coast Z. trifolii appears in early July and continues all the month. It is especially fond of damp meadows with rivulets flowing through, settling on rushes and the stems of "ragged robin," the heads of which are favourite resting and copulating places. I do not think, or at least I cannot recall that I have seen Z. filipendulae in such meadows, but in the broad roads crossing Dartmoor and its neighbourhood, with their wide grass "sidings" on each hand, Z. filipendulae is quite frequent, though it prefers the edge of the moor and the more sheltered portions of the grass paths. Again, as with M. Oberthür, I should date its first appearance at the middle of July. I have had a somewhat similar experience with the same species in the Isle of Wight...

Z. lonicerae appears rather later than Z. trifolii, and I cannot remember finding these two in the same bit of country. In the Isle of Wight Z. filipendulae was very much commoner than Z. lonicerae and Z. trifolii, the latter of which was not infrequent on the edges of

the cornfields, whilst I found the same habit in Cornwall.

There is, however, another point to consider. I have preparations of the genitalia of all the species, and there is no question of the distinctness of these. The clasps and the uncus of Z. lonicerae are quite different in shape from those of Z. filipendulae, and the same difference applies to Z. trifolii. Of Z. stoechadis I have very little personal experience.

Turning now to my continental observations, I should say that the habits of Z. filipendulae and Z. lonicerae differ considerably from those obtaining with us. Their habitats are essentially meadows and pastures—the mountain sides and the valleys are the localities for both species,

APRIL 15TH, 1918.

and they fly together, the times of emergence differing, according to the latitude or altitude.

I well remember in one of my walks across the Great St. Bernard Pass, when we had got well down towards Aosta, a sight I shall never forget, field after field of hay in all their superb "richesse" of flowers, and almost every head of flowers covered with one or more specimens of Zygaena—five-spotted and six-spotted forms freely copulating. The day was brilliant and the heat great—a perfect day to wanton and indulge in all one's lazy whims and fancies. My father-in-law and I spent hours amongst those fields taking notes and specimens, and we both came to the conclusion that any species of Zygaena found no difficulty in copulating with any other species. Whether the ova would prove fertile is another question, but the fact remains that such species of Z. filipendulae and Z. purpuralis (minos as we used to call it in those days) were found in copulâ.

Further examination and more experience of the genitalia convince me that there is no structural reason why different species should not copulate with each other, the only thing that is needed is a superabundance of specimens such as I witnessed in the Aosta Valley, when apparently as soon as a female emerged and had got over the flaccid or limp condition that obtains immediately on emergence, it is merely

a case of which male species arrives first.

In this genus also I have no doubt that the males copulate more than once, for to quote one instance only, Zygaena carniolica var. heydisari, at Alvaneu Bad, where I found more than one case of a male, that was almost denuded of scales, copulating with quite fresh females.

But to return to the species in question, the whole genitalia show decided differences in shape, and I have no doubt that Z. filipendulae, Z. lonicerae, Z. trifolii, and Z. stoechadis are different species. I am now having photographs made of my preparations of the genitalia, and at a later date I will illustrate the differences in this magazine and thus confirm my observations.

Collecting in various places (1914-1917).

By CAPT. P. P. GRAVES, F.E.S.

The following notes re collecting at certain places, some of which are not too well known to naturalists, may be of interest to readers of

the Entomologist's Record.

After escaping from Constantinople I spent three or four days at Dedeaghatch, in "Western Thrace," which I finally left on November 3rd, 1914. The country round Dedeaghatch looked promising, but it was too late in the year and too wet to expect any diurnals and a damaged Pararge megera with a few Pyrameis cardui, seen during a fine spell, were all the butterflies I observed. I have already described my experiences in Egypt in November, 1914, and thence till March, 1915. At the end of March, 1915, I repaired to Athens for Tenedos, where I spent four days.

Tenedos, March 28th-April 1st, 1915.—The bareness of the island, which is windy, boasts singularly few trees, and must be very much dried up in summer, did not lead me to expect many captures, but during the four days I spent there I saw a number of insects, all, or

almost all, belonging to "distinguished" species. Pieris brassicae was commonest; my only P. napi resembled the Constantinople spring race, and my Anthocharis crameri (belia) var. esperi, were somewhat smaller than the fine race which occurs in Mitylene, near Athens, and near Constantinople. The one female I took had the upperside hindwings decidedly yellowish. The butterflies seen or captured here were, Erynnis alceae, Rumicia phlaeas, Pieris brassicae, P. rapae, P. napi, Pontia daplidice g.v. bellidice, Anthocharis crameri (belia) var. esperi, Colias edusa (one seen), Pyrameis cardui, P. atalanta, Pararge megera (not uncommon), and Coenonympha pamphilus (apparently the northern form).

On April 2nd I was at Mitylene. Here conditions were very different. There were trees (chiefly fruit trees and olives) in great abundance, the ground was much dryer, the outcrop of rock on the hills more considerable, the flora far more Mediterranean than Tenedos, which seemed to me, as far as I could judge in a brief stay, to be much more like the Bosphorus shores in respect of its vegetation. But though Mitylene seemed attractively southern, it was by no means rich in Lepidoptera. A gully in the limestone, about three miles from Mitylene Port, gave me four specimens of Thais cerisyi, one already worn. These specimens appeared to me to be large, but typical, examples of the normal Asia Minor race. With them I took a very battered Doritis apollinus. At Hiera, a warm sheltered place on the shore of one of the gulfs (that lying S.S.E. of Mitylene Town), which are so marked a feature of the coast line of the island, I enjoyed some delightful views but caught little beyond a good short series of Anthocharis crameri (belia) var. esperi. I saw no "blues" in the island and no sign of Callophrys rubi on the hills above Mitylene, on ground that seemed very favourable for this insect. My captures and observations in Mitylene, April 2nd, 1915, were the following:—Rumicia phlaeas, Iphiclides podalirius (one seen), Thais cerisyi, Doritis apollinus, Pieris brassicae, P. rapae, Pontia daplidice (very few), Anthocharis crameri var. esperi, Pyrameis cardui, P. atalanta, and Pararge megera. I left for Athens on April 5th, by a nocturnal boat. I regretted having such little opportunity of exploring the interior of Mitylene, and am still of opinion that the Lesbian Olympus and the pine clad "Chamlik" area might produce some interesting insects in early summer.

Athens, March 27th, April 6th-30th, and May, 1915.—Athens is sufficiently well known to entomologists to excuse a lengthy treatment of the entomological results of my stay there. I may say at once that these results were rather disappointing. Butterflies were only frequent at one or two places, notably on the Daphne Road, about four miles out of Athens, at one or two points on the way up Hymettus (beware fellow collector of the large and really dangerous sheep dogs which dwell there!) and on Mendeli Mountain (Pentelicos), during the last week of April. My most interesting captures were Hallia marloyi, of which I took a small specimen near Daphne, on April 10th, Melitaea phoebe, a very large brightly coloured and generally heavily marked form of which was not rare near Daphne, and occurred sparingly elsewhere. Cupido sebrus, of which I took a female on Mendeli, below the Monastery, on April 23rd. Thais polywena var. cassandra, two specimens, and the fine second brood form of Anthocharis crameri var. esperi, rightly named "maxima," which was just coming out on May 3rd. I

never hit the right spot for Agriades thersites, only three males of which fell to my net, and though I took several very hispulla-like males of Epinephele jurtina at the beginning of May, I am not prepared to say definitely what form it is, having no females. An expedition to Tatoi, on April 26th, in the hope of obtaining Pieris krueperi, was unsuccessful. I saw some Pierids, which might have been P. krueperi, gambolling in the depths of an inaccessible gorge, but Glaucopsyche cyllarus and Leptosia sinapis were the only insects I brought back with me from ex-King Constantine's estate.

In the following list H. signifies Hymettus, D. Daphne, A. Athens,

T. Tatoi, K. Kephisia, and M. Mendeli.

Hallia marloyi, D., October 14th, 1915; Erynnis alceae, sparingly everywhere; E.? orientalis, generally distributed and more frequent than E. alceae. This insect was slightly darker than Constantinople specimens of E. orientalis, and it may possibly prove to be althaeae. Powellia orbifer, D.A., rare; Thymelicus acteon, just emerging in some numbers on May 3rd, D.A.; Rumicia phlaeas, A., March 27th, and later, D.H.: Callophrys rubi, D., April 10th, M., April 23rd; Polyommatus icarus, from April 7th, generally common, blue females frequent; Agriades thersites, three males only, D., April 15th, M., April 23rd, H., April 25th; Aricia medon, frequent everywhere; Cupido sebrus, M., April 23rd; Glaucopsyche cyllarus, generally frequent; Scolitantides baton, D., fairly frequent but going over, April 7th-15th; Papilio machaon, twice seen on the Mendeli Road; Iphiclides podalirius, A., March 27th, M., April 23rd, T., April 26th, always singly; Thais polywena var. cassandra, D.H., rare; Pieris brassicae, common, but going over everywhere after April 10th; P. rapae, generally common and worn in late March, second brood specimens taken on May 5th; Pontia daplidice, A.D., common and worn from March 27th to April 15th; Anthocharis crameri var. esperi, A.D., frequent in April, one g.aes. maxima on May 5th, at Daphne; Colias edusa, a few seen everywhere; Gonepteryx cleopatra, A.D., fresh on March 27th, and worn in April; G. rhamni, seen at Tatoi only, April 26th; Leptosia sinapis, M., rare, April 23rd, K., April 25th, T., April 26th; Pyrameis cardui, here and there; P. atalanta, A.M., occasionally; Melitaea phoebe, D., fairly frequent, H.M.; Pararge megera, sparingly at all localities except Kephisia; P. maera, M., April 28th; P. aegeria, one only, M., April 28th; Epinephele jurtina, D., May 5th; Coenonympha pamphilus var. lyllus (southern form), D.H.M.K., sparingly. The total amounts to only 31 species.

My Egyptian results in 1916 and 1917 must be described on another occasion. En passant I may here remark that I spent eight days at Bude, from June 20th to June 27th inclusive, in 1916, and though the weather was not too favourable saw a fair number of common butterflies, and captured Brenthis selene and Melitaea aurinia not very far from one of the Lycaena arion localities. Returning eastward all too soon, I was held up for a week at Marseilles, from July 1st to July 7th, and while waiting for a transport paid three visits to a locality, which is doubtless well known to French collectors, but is not familiar to me, to wit the pretty little village of Allauch, which is reached by tram (time about 40 minutes from the Hotel de la Grande Bretagne), and had quite an abundant Satyrid and Pierid population. My captures there were, Erynnis alceae (2), Polyommatus icarus, Aricia medon (second broods of both just emerging), Pieris brassicae, P. rapae, P. manni, in

pine woods, not rare; P. napi g.a. napaeae, Colias edusa, Gonepteryx cleopatra, Pyrameis cardui, P. atalanta (seen in the town), Polygonia egea (one seen in the Marseilles suburbs), Pararge megera, Satyrus circe, a few very large specimens; S. alcyone, just emerging; Hipparchia briseis, fresh and frequent, males smaller than the Sea of Marmora race, both female forms occurring; H. semele, just emerging, large and brightly coloured; Epinephele jurtina, southern in facies; E. pasiphää, a few worn specimens: E. ida, abundant and small; Coenonympha dorus, abundant, but going over. Total 21 species.

dorus, abundant, but going over. Total 21 species.

Malta.—Here, on May 7th, 1917, I saw Pieris brassicae, P. rapae,
Pontia daplidice and Colias edusa with the inevitable Pyrameis cardui.

The fine dragonfly, Anax imperator, was flying round some tanks in a garden near the tunnel which precedes the last station on the Malta

Railway.

In Macedonia in 1917.

By CAPT. MALCOLM BURR, D.Sc., F.E.S.

The first entomological observations for the year were in Greeces and are extremely meagre; walking over the Acropolis, at Athens, on January 27th, I saw a small Fritillary, and a single Epacromia thalassina. More interesting, that early in March I came across freshly hatched specimens of Locusta viridissima at Corinth; the weather was far from mild, but this was a full month before I should have expected them at this latitude.

The first of May found meenjoying summer weather on the Struma front; the rocks were a mass of a mauve Cistus, and the valley ablaze with spring flowers of every kind and colour, in rank luxuriant growth; last year's trenches were hidden by the young vegetation, and fields of opium poppies, abandoned by the population, gave a mass of flowers to adorn the messes. The gorgeous bee-eater was already flashing in the sun, wheatears and warblers abounded, and the clumsy but brilliant roller, called by the Serbs the "stinking crow," was very much in evidence. Our common British grasshoppers, Omocestus viridulus and the universal Stauroderus bicolor, were already in full buzz. Bright green Cetonias were flying around, and the commonest butterflies were a Wood White, the two Swallow-tails, and worn Pyrameis cardui. Within a week Decticus verrucivorus, which is very common, had already reached the nymph stage; in the south of England this species would hardly yet be hatched. Acridium aegyptium was common, and the two red-winged species of Acrotylus. The yellow-winged A. longipes, Charp., I only once came across out here, a single specimen on the beach on the Gulf of Orfano, in the beginning of November in the previous year. Cuckoos, nightingales, and whitethroats were in full song, and nightjars were whirring in the valley, although there was no timber there. I found dead teazle-heads full of freshly hatched macrolabious Forficula auricularia, L., on May 10th, but saw no other earwigs this year except the usual Labia minor, L., which flew to light in numbers in the middle of the summer. On May 23rd I heard the first chirp of Decticus verrucivorus, took a female nymph of Glyphanus obtusus, and saw the first adult Dinarchus dasypus, Illig. This portly creature is a great favourite in Macedonia; his insistent stridulation, which is loud and prolonged, his startling black and bronze coloration, and his corpulent figure, render him very prominent; he constantly attracts a great deal of attention even from the least observant, and as he is very common in places, specimens are often submitted to me, usually with a query

whether or not they are dangerous.

On May 31st, Locusta viridissima, L., was adult, and fresh Decticus verrucivorus, L.; I came across a belated Acrotylus insubricus, Scop., tiny Œdipodid larvæ, and fairly numerous nymphal Glyphanus. A pretty green apterous Phaneropterid, with black and pale markings on the dorsum, was in evidence on shrubs, but it is hopeless to attempt to name the numerous species of this group; it is difficult enough with a good library and collection for reference; in the field it is out of the question. Gampsocleis abbreviatus, Br., appeared, but not in such numbers as last season at Lembet; several species of Platycleis, and some other Decticids, were abundant but immature.

One small incident about this time was for a moment rather start-ling; our anti-aircraft guns were popping away in the distance, a pretty regular occurrence, when I saw against the bursts of shrapnel and clear blue sky, a fleet of fifteen aeroplanes coming straight over the village where we were quartered; "here comes a bombing squadron," I thought, and made a bee-line for the nearest cover, then the squadron resolved itself into a flock of storks, flying low and straight, with immovable wings. Storks frequent the villages in great numbers in the summer, and I have counted fifteen nests in one old plane-tree. The other common birds of the villages are incredible flocks of starlings, innumerable sparrows, and a few quaint and noisy little owls.

Early in June, on scrub in a little donga, I found nymphs of Acrometopa; a little later, when they were mature, they turned out to represent two species, one grass-green, one bluish-green, one with rounded elytra, the other with truncated elytra; they must be A. macropoda, Serv., the common Mediterranean form, and the rare Levantine A. syriaca, Br. By the middle of the month Acrotylus insubricus, Scop., was adult, and also Platycleis grisea, F., and one of its allies, probably P. affinis or P. laticauda. In Blattids, only Loboptera decipiens and

Hololampra marginata, Schreb., were to be found.

Beetles were numerous. After the Cetonias, the most prominent were Longicorns; one handsome black and red species, of medium size, occurred in numbers on the lofty and powerful thistles; these squeak angrily when handled, and continue to squeak protests and to kick for quite a long time when plunged into alcohol. Fine, sleepy Buprestids were common, and on the heads of the same thistle were numbers of very sluggish, biggish, black weevils, with long curved snouts, the whole body dusted with a mustard-yellow. The snout was usually buried in the stem of the thistle; a small Prussian blue Elaterid was common on the same thistle, which was a good collecting ground. There were numerous Hemiptera, the commonest being a purplish Pentatomid and a black Capsid. Immature Mantids appeared to be all M. religiosa and Ameles sp., but the mess-waiter brought me in triumph one day a "very peculiar fly," which turned out to be a much dilapidated adult Empusa, probably E. egena, Charp.

On June 28th, I met Lieut. C. D. Day, R.A.M.C., whom I found a most enthusiastic field naturalist; he had made extensive collections of almost all groups, but especially reptiles and Diptera, which he constantly sent home in small packets. I persuaded him to take up Or-

thoptera, and before the end of the season he had accumulated a pretty representative collection. At an altitude of about 100 feet above the sea he found Dinarchus dasypus very abundant, and I came across Ectobius lapponicus, L., for the first time out here; these were of the typical form. On the last day of the month Acrometopa of both species was fully developed and numerous in the same donga, and a species of Olynthoselis, the first I have noticed out here, as far as memory serves, and then Entomology finished for me for the season. I had no chance of collecting again this year, and only by chance added a species to the list of those which I have noticed in Macedonia, picking up a belated

Euprepocnemis plorans at Lembet, late in the autumn.

The collections which I made last year were fairly extensive and representative. I had hesitated to send them home, for fear of losing them, preferring to store them temporarily at Salonika. They were destroyed, with some other property, in the famous fire which ravaged the town in August, so now I have the mortification of having little or nothing to show for two complete years spent in Macedonia. The only entomological satisfaction which came to my lot this year was a few minutes chat with my old and highly esteemed friend Dr. Alfredo Borelli, who came to the station to see me when passing through Turin in the middle of March. Let us hope that 1918 will bring us all better luck, in every respect.

New and Rare British Cecidomyidæ.—III.

By RICHARD S. BAGNALL, F.L.S., and J. W. H. HARRISON, D.Sc.

(Continued from Vol. xxix., page 230.)

The following records are some that we have been able to add to our "Preliminary Catalogue of the British Cecidomyidae" whilst going through the press, and any that we may record after this present short contribution will be additional to the catalogue. The discovery of Miastor is of particular interest.

Trotteria umbelliferarum, Kieffer.

On Anthriscus.

Durham, Gunnergate, J.W.H.H.

Rhabdophaga pseudococcus, Rübsaamen.

On underside of Salix caprea leaves; larva broad and flat, under a silky covering, which gives it a curiously Coccid-like appearance.

DURHAM. Plentiful on isolated trees, Ryhope Dene and Hesledene, R.S.B.

Rhabdophaga pulvini, Kieffer. Houard, S(alix) 19. Characteristic galls on Salix aurita and S. vitellina.

NORTHUMBERLAND, Ovingham, R.S.B.

Perrisia lithospermi, H. Loew. Houard, 4741.

On Lithospermum officinale.

NORTHUMBERLAND, Ovingham, on an isolated patch of the host-plant, R.S.B.

Perrisia panteli, Kieffer = Cocidomyid sp. Houard, 1815.

On oak, affecting the midrib as well as the secondary nervures of the leaf.

YORKSHIRE, Leeds, numerous examples from one old tree, R.S.B. NORTHUMBERLAND, Ovingham, one example only, H. S. Wallace.

Previously known from Spain. The British examples more strongly affect the leaf than described by Houard, and are not limited to a nervure secondaire. It may prove to be another species.

Miastor sp.

In dead wood, increasing paedogenetically. Durham, Birtley, J.W.H.H.

Endaphis perfidus, Kieffer.

Endoparasite of Aphis plantanoides on Sycamore. NORTHUMBERLAND, Warkworth, R.S.B.

Endaphis sp.

Endoparasite of an Aphis on *Ononis*. Durham, Penshaw Hill, R.S.B.

Cecidomyid sp. Houard, 5450.

Leaf pustules on *Knautia arvensis*. Northumberland, Ovington. Durham, Ryhope, R.S.B.

Cecidomyid sp. Houard, S.60.

On Salix spp. Northumberland, Ovingham, on S. aurita. Durham, Easington, on S. caprea, R.S.B.

Cecidomyid sp.

On Achillea ptarmica, galls singly situated on stem at angle caused by juncture with leaf; about 3mm. long by 1mm. broad, more or less fusiform; cavity containing a solitary yellowish-orange larva (which may be that of a parasite). Integument thin, but hard.

Cecidomyid sp.

Larvæ crimson feeding in rotten turnips. Durham, Birtley, J.W.H.H.

[Note.—It should be noted that the Cecidomyid sp. recorded on p. 229 of our last contribution without foodplant, is from honeysuckle. The record should read, "On honeysuckle leaves, reddish larva feeding externally on what seem to be parenchymatous galls."]

POTES ON COLLECTING, Etc.

LUPERINA (APAMEA) TESTACEA.—A long series of Luperina testacea, taken some years ago in West Cornwall, and not in prime condition, has recently been sent for inspection. The ground colour and general coloration of all the specimens is of a somewhat deep dull umbreous brown, and not one has the hindwings of the pure white, which always distinguishes the usual inland forms. Only two very dwarf specimens have hindwings which can be called white. There is considerable variation inter se, although none are very dark and none very

light. Several are very uniform with markings almost wholly suppressed by the ground becoming as deep brown as the markings. In no examples are the markings present with any emphasised degree of definition except the double lines bounding the submarginal lighter band. The transverse central band only in some cases is distinguishable from the general ground. In one or two specimens the blackish bar below the stigmata is well marked. The females have the hindwings browner and are larger. This is certainly quite a distinctive race. Possibly some of our readers who have more recent series from the West will look them up and compare them with the inland races. Barrett says, "Not a very variable species inland, but on the coast, and especially on the western coasts, it is quite otherwise." Is this so?—H.J.T.

Since writing the above I have again referred to Seitz, "Mac. Lep.," vol. iii., Palaearctic Noctuidae. There is a figure on plate 43, named rufa, which is in no way referred to in the text or Index, but in the Appendix is stated to belong to testacea. This figure agrees very well with the average appearance of the Cornish specimens, so that they may be referred to as var. rufa. However, one would like to know where the original description of this form occurs and the author of the name. Possibly one of our readers can help me with the references.—H.J.T.

FIELD NOTES FROM BATH, WITH SPECIAL REFERENCE TO TERAS CON-TAMINANA. HB.—To complete my notes from this district in 1917, I may mention that several larvæ of Eupithecia subfulvata occurred on yarrow, under a hedge, at Swainswick, on October 6th, and that a ? Asteroscopus sphinx was found at rest in a hawthorn hedge on November 11th. She subsequently laid a few ova. Early in October I took several pupe of Acalla logiana off Viburnum lantana growing in the more sheltered lanes. This was really too late to look for them, as many of the dwellings had been rifled by birds (?) and a few pupe had already emerged. Probably in the middle of September dozens might have been found, as the puckered leaves were abundant. Of those I bred, the first appeared on October 6th, and the last on November 12th. The specimens vary from unicolorous brown to those with the ground colour soft pale grey speckled with rich brown dots, with the usual large irregular costal triangle of the same rich tint. Occasionally the triangle is broken up into three spots. My few specimens make me wish I had gathered the larvæ at the end of August, then I might have bred some really striking forms from the number that might have been obtained.

As this was the first autumn that I ever collected the common Acalla (Teras) contaminana, may I say a few words about this species. At dusk the imagines fly rather gently over the hedges, making short zigzags in their progress, and usually settling after a short flight on the leaves or twigs on the outside of the hedge. They abounded on every hedge or bush of whitethorn, even in the outskirts of the town. On the road towards Combe Hay there is a long row of blackthorn, and there is no whitethorn very near, but the moths were quite plentiful on the blackthorn, on which their larvæ had probably fed. On one occasion I saw a moth of the red-brown variety at rest on a red-brown leaf of whitethorn which had exactly the same ground

colour as the moth. This would have been probably overlooked but for the white cilia on the termen. The moths mostly rest on the green leaves and usually beneath. When beaten out they either fly briskly straight-away for a short distance and then return to another part of the hedge, or they flutter down to the herbage below, where, if followed, they drop among the roots of the grass. They have an awkward habit of resting on the grass, after having been disturbed, with the underside exposed to view, so that it is generally necessary to box them for examination, which leads to loss of time. Even the dark specimens appear pale on the wing on account of the light colour of the hindwings and underside. The first specimen was seen August 14th, and a few were noted still lingering in the thorns on October 15th: they were most abundant during the second and third weeks of September.

In October I placed a 2 with a twig of hawthorn in a box. She laid several ova on the box, especially along a seam where the lining joined, but none on the twig or leaves. On February 25th, this year, I noticed that some of these ova had hatched, and also that the hawthorn was showing green buds in sheltered situations. A few more larvæ came out on the following days. One, which was very active, burrowed into a hawthorn bud, but I could not find it in the bud the next day though it had evidently fed a little. Having no microscope here, I can only say the eggs are of the form usual to this group, they were laid singly or in very small patches. The head of the newly hatched larva is black, prothoracic shield brown with a pale collar, and the body pale ochreous.

The imagines vary much in size, my smallest measuring 14mm. and the largest, a male, 19mm. Among those I took there are four quite distinct forms and these all vary in themselves. It would be interesting to obtain two specimens exactly alike, a feat I have not succeeded in doing. The most abundant form, which far outnumbered the other three all put together, was that in which the forewings are reddish-ochreous, with a darker, more or less complete, central fascia. Some specimens are nearly brown, others nearly orange, as regards the ground colour. Some are nearly unicolorous, the fascia and reticulation being lightly marked, while in others these markings are quite dark brown, and in addition the costal spot is present. In this form the white raised tuft is often conspicuous. I suppose this form is the ciliana mentioned by Wilkinson (Brit. Tort., p. 150), but there is no marked difference in the cilia. The neatest specimen is one with a very bright ground colour and the central fascia sharply marked in outline only. The next most common form, in point of numbers, was that with the thick Y-like mark and very strong reticulation, which, according to Wilkinson, is the type contaminana. In the palest specimen the ground colour is nearly white and the mark dark grey. another the wings are bright ochreous, and the strong reticulations and mark are formed of a mixture of black and chestnut. Sometimes the mark is brown. In all except one specimen the mark comes to a point before reaching the dorsum. The third and fourth varieties were rather scarce but occurred with the others. The third, in its best form, is quite handsome. The forewings are of the colour of the ab. ciliana in its more orange phase, but the reticulation is less noticeable. The central fascia is of the ciliana form till just above the fold, here it swells out into a large blackish patch, which is continued to the dorsum. The costal patch is elongated and reaches to the middle. The angulated basal patch in the other forms is marked in outline only, it is the same here, but at the angle there is a large dark spot, which sometimes has a pale centre. This subbasal spot is the most distinctive feature of this aberration. One specimen approaches straw colour and has the first portion of the central fascia only in outline. This spotted form is mentioned by Stainton (Manual, vol. ii., p. 227). The fourth form is a very dark insect. The ground colour rich chestnut, clouded at the base with very dark grey. The central fascia and the whole of the apical part of the wing blackish grey. The hindwings are decidedly grey, much darker than those of any of the other forms. In some specimens the forewings show an almost even mixture of black and chestnut. This form I take to be the rhombana mentioned by Wilkin-The most interesting specimens are those which connect the different forms. Among these are two ab. ciliana in which the costal spot joins the central fascia, making thus the Y-like mark. A third, which is distinctly of the Y form, shows the dorsal enlargement of the fascia, the basal spot and prolonged costal spot, which are the distinctions of the spotted form. One ciliana connects this with rhombana, and one rhombana has the basal spot. I should be glad to know if there are any other distinct forms of this variable species, for among the specimens collected here some show further possibilities. For instance have the following ever occurred: the only marking, a dark costal triangle; any form with a thick streak from the central fascia to the base; with three dark fasciæ, a basal, the central and the costal spot prolonged to the dorsum, and lastly with forewings entirely black? In conclusion I will note the figures in Barrett's work (Lep. Brit. Isles, vol. x., plate 450). Figure 3 shows the form I have alluded to as ciliana, figure 3a the Y-form, and 3b a pale and poorly marked specimen of what I have quoted as rhombana. I have never seen a figure of the handsome spotted form.—Alfred Sich. March 18th, 1918.

Some Field Notes for 1916-17 (Continued).—On August 23rd, 1916, about 20 3 Orgyia antiqua were observed assembling to a 2 in a small tree at East Dulwich, at about eleven o'clock in the morning, and on the 24th three batches of Porthesia chrysorrhoea ova hatched.

When in the Isle of Wight in September, a friend informed me that in the previous winter, when doing some repairs to a building, 172 queen wasps were found hibernating under the ridge along the top of the roof.

On October 12th worn specimens of *Epirrita* (*Oporabia*) dilutata were found at rest on fences at East Dulwich. At Midhurst, Sussex, on November 13th, specimens of *Xylina ornithopus* (*rhizolitha*) were resting on fir trunks, and in a road through a wood I discovered a number of wings of *Hibernia aurantiaria* lying on the ground.

Specimens of *Cheimatobia brumata* were resting on fences at East Dulwich on December 1st, and up to December 31st ova obtained from a ? *B. trifolii*, from Dorset, were still unhatched, but on February 24th, 1917, the first four larvæ hatched out, and they continued to hatch at intervals until April 7th, when the last two appeared. They all took very kindly to the ordinary grass found in a garden.

At Three Bridges, Sussex, on February 28th, I saw the first *Hibernia leucophaearia* at rest on a fence, as against January 11th in the previous

year. At Wimborne, Dorset, on March 14th, a single specimen of Hibernia marginaria (progemmaria), at rest on a lime trunk, was the only insect seen. On March 16th, at Bromley, Kent, 4 H. leucophaearia (2 worn), 4 H. marginaria (progemmaria) (2 worn), and a & Phigalia pedaria (pilosaria), were found at rest on fences. On the Isle of Wight, during the nights of April 3rd and 4th, a heavy snowstorm came on, and the following morning snow was lying in drifts four feet and six feet deep in places, quite an unusual thing in the island, and consequently no entomological observations were possible. The scarcity of potatoes and other vegetables in London led to my trying my hand at a little gardening about this time, and enabled me to devote a little thought to economic entomology, and to wonder why some insects were on the earth at all, they certainly would not be missed if it were possible to exterminate them, but the conclusion I eventually came to was that, while they destroyed some of our food, they in turn fed the birds, whose songs were an ample compensation. On April 7th I dug up three hunting spiders, which were very lively, one larva of the beetle Ocypus olens, two millipedes, and a full fed larva of Triphaena Unfortunately for the beetle larva I put it in the same tin as one of the millipedes, which immediately seized it behind the head with its mandibles and carried it off. I also turned up a centipede, and various batches of semi-transparent eggs, which I believe were those of a slug, but I failed to get them to hatch, as even when they were placed in a tin with damp earth, they shrivelled up.

On April 18th I saw a 3 Apocheima (Biston) hirtaria at rest on a fence at East Dulwich. On April 21st I dug up a larva of Agrotis segetum, together with some T. pronuba larvæ, and a millipede half an inch long, and another two inches long. As showing the backwardness of the season, almond blossom was only just coming out on April 25th, whereas in some seasons it is out at the end of February, and I do not think I have ever been so pleased to see a swallow as I was on

this day, when I saw four at Alton, Hants.

On May 1st I was awakened by the twittering of swallows outside my bedroom window, at Petworth, Sussex, to find a glorious day, with a cloudless sky. On the way to the station *Pieris brassicae*, *P. rapae*, *Gonepteryx rhanni* (3), *Aglais urticae*, and *Celastrina argiolus* were seen, and I heard that six *Eugonia polychloros* were taken two days previously.

I went on to Midhurst, and in walking through a wood found one Taeniocampa pulverulenta (cruda) and two Tephrosia bistortata 2 s at rest on tree trunks. Both the latter laid ova on the following day (May 2nd), which hatched on the 15th. The ova and young larvæ from one ? (brown) were quite noticeably smaller than those from the other ? (dark grey), the ova of the former were pale cream colour with hardly any trace of green, and laid loose in the pillbox, whereas the latter were a rich green and laid in strings. I subsequently fed the larvæ on The first pupated on June 18th and the last on June 29th, and contrary to my expectations one batch produced only a partial second brood, the first image emerging July 6th, the other none, the remainder of the pupe going over the winter, with the exception of one imago which emerged on December 18th, during a heavy frost, but failed to expand its wings. All the emergences were from the dark grey ?. During a walk on the Downs, near Brighton, on May 7th, although birds were plentiful, the only insects seen were a few Pieris

rapae, Ematurya atomaria & s, Humble-bees, and a small black Lady-

bird with red spots.

The weather now continued fine right on into the summer, and as it promised well for a "butterfly year" I decided to work the summer broads of butterflies, especially as, owing to the restriction on the use of the camera, outdoor insect photography was all but impossible.

On May 9th I saw a 3 Euchlos cardamines and some Celastrina argiolus flying in the streets of Lewes, Sussex, and during a walk on the Downs a Tiger Beetle was carried away on a strong cold N.E.

wind, and was the only insect seen.

At Dulwich, on May 13th, P. rapae was flying in abundance and ovipositing in the kitchen gardens, and C. argiolus was not uncommon. Larvæ of T. pronuba had now changed to pupæ, and pupæ of Mamestra brassicae were far too commonly met with. Two earwigs were more than once disturbed, in association, in a cavity in the earth and once in a flower head, and later on in the season, at Boxhill, I came across another pair, and in each case the pincers differed; in one individual they were small and semi-circular, and in the other they were straight. I know nothing of earwigs, but was under the impression that, apart from minor variations, the difference in the pincers denoted a different Two ichneumon flies emerged from pupe of Hecatera serena (larvæ taken at Eastbourne, August 17th, 1916), which I have not yet been able to get identified. The ichneumon larvæ spun no cocoon, and it is obvious that these flies must prey on another host in the spring, and are probably double-brooded. Agrotis segetum larvæ had now pupated.

On May 18th I found in my garden a freshly emerged Taeniocampa instabilis at rest on the fence, and a number of Cheimatobia brumata larvæ spun up between apple leaves. A 3 and 2 Hemerophila abruptaria were also resting on the fence, and in the evening a number of P. rapae were found at rest on apple trees, grass and cabbages, and a number of batches of ova were destroyed in the day time on the under-

side of cabbage leaves.

At Farningham, Kent, on May 22nd, Anaitis plagiata was seen at rest on a fence, and on the 23rd a 3 H. abruptaria was taken at rest on a fence at Dulwich.

On the 31st Xanthorhoë fluctuata and Eupithecia venosata were found at rest on fences at Swanley, Kent, and a \$\mathbb{A} pamea basilinea was flying in the midday sunshine. A strong wind developed in the afternoon, and the platform, etc., of St. Mary Cray Station was alive with C. brumata larvæ, which had been blown down from the birch trees which

they had stripped nearly bare.

On June 5th Triaena (Acronicta) psi was taken off tree trunks at Dulwich, and Mamestra brassicae started emerging. On the following day a 2 Spilosoma lubricipeda was found at rest on the fence, while rose sawfly larvæ and C. brumata larvæ were discovered busily engaged in defoliating the rose trees. At this time C. brumata larvæ were reported as doing an immense amount of damage to the apple trees in Kent, and large acreages were to be seen in both East and West Kent practically bare of foliage.

On June 8th Dianthoecia carpophaga started emerging from East-bourne pupæ. Orgyia antiqua larvæ were found devouring the leaves of my plum trees, and caterpillars of one of the small "ermine" moths

were found in webs defoliating my apple trees. A \circ Spilosoma lubricipeda was found at rest in the garden, and laid a batch of ova during the night, which hatched on June 15th. Specimens of Apatela (Acronicta) aceris were also found at rest on the trunks of some elm trees.

On June 9th T. pronuba started emerging, and Abraxas grossulariata larvæ were now yielding small ichneumon larvæ which spun the familiar grey cocoons with a black band round the centre. Three of these flies emerged on the 16th and one on the 18th June. I am writing these notes away from home, so cannot give their scientific name. On the 10th a ? Amphidasis betularia var. doubledayaria emerged. I found the larva on Mountain Ash in my garden in the

previous autumn. Agrotis segetum also started emerging.

On June 11th I went for a walk to Shirley Hills and Addington, and on the way Coenonympha pamphilus and Polyommatus icarus were indulging in mock combats, while a Rumicia phlaeas settled on a stone to sun itself, and a pair of Pieris brassicae were disturbed in cop, when the 3 was observed to carry the 2. Both P. brassicae and P. rapae were in abundance, and busily engaged in making love in the hot sunshine, the ? flying in circles in a rising flight, the & flying just below her in larger circles. While butterflies appear to revel in the hot sunshine, most birds seek the shelter of trees and sing little during the midday heat. In the sides of the wood Euchloë cardamines, Camptogramma bilineata, and Venilia macularia were lazily flying. Oak and hazel trees were stripped nearly bare of their leaves by C. brumata larvæ, and a number of ichneumon flies were running over the remaining leaves, waving their white tipped antennæ vigorously while searching for victims. An opening in the ride, which allowed the sunshine to penetrate, was the playground of the Diptera Bombylius major and B. minor and a large bee-like fly, which spent their time hovering in the air, the last every now and then darting to one side to capture an unhappy fly that was also hovering with its fellows. The latter apparently were not alarmed at the fate of their companion, and soon suffered the same fate themselves. A hunting spider was running over the leaves in search of victims, while a green lacewing fly was busily engaged devouring aphides on a leaf stalk, and a luckless larva was found that was shedding through its skin four dipterous larvæ, and not far off an orb-weaving spider sat in the middle of her snare waiting for something to turn up. These notes and observations were made on the spot within the space of about ten minutes, and one can scarcely imagine the enormous destruction of insect life that goes on at almost every hour of the day during the spring, summer and autumn. A little further on I came across a hornbeam whose leaves were riddled by a species of sawfly larvæ, and watched a hunting spider carry off a C. brumata larva, while a dipterous fly attacked a larva that already looked half dead with ichneumon attacks. One Tephrosia punctularia, one Xanthorhoë fluctuata, and a number of Triaena psi were found at rest on oak trunks.

On the way home across the fields in the dusk the only day flying insect seen was a Humble Bee, busily engaged in fertilising the flowers of the Broad Bean, which reminds one of Wordsworth's lines, and testifies to the accuracy of his observations.

One June 12th more Apatela aceris were seen on dark elm trunks, at Dulwich, where they showed up as a light, almost white patch, and

on the following day a fairly large ichneumon fly, with a yellow band round the body and looking very wasp-like, emerged from a pupa of *T. pronuba* (Dulwich). I had seen the flies hovering in my garden, and

was very pleased at discovering the identity of their host.

C. brumata larvæ which I had collected in the garden were now pupating. About this time I was continually discovering batches of various Noctuid ova laid on potato leaves, cabbages, Brussels sprouts, delphinium, and other leaves, also larvæ, most of which I reared to the pupa or ichneumon stage, but as my ignorance of some of the common larvæ is profound, and as most are still in the pupa stage, I shall have to reserve my note on them for a future occasion. On June 16th I found a ? Spilosoma menthastri just emerged, and an A. hirtaria larva feeding on plum, which had three ova of a dipterous fly attached to its skin near the head. On the following day it had shed its skin and with it the three fly ova, which remained attached to the old skin and still unhatched.—C. W. Coltheur. (To be continued.)

Abundance of Early Geometers and the Early Season.—During a short stroll over Ludshott Common from Hindhead, on February 11th, I found Hibernia leucophaearia and Phigalia pedaria (pilosaria) out in astonishing numbers. Not only out, but in spite of the early date the greater part of them were worn, although others were still emerging, as several were found drying their wings. The numbers were quite phenomenal; especially so on a scattered belt of small oaks and birches edging a wood. On the first one of these trees that we approached, there were five P. pedaria (pilosaria) and several H. leucophaearia, and this tree proved to be no exception.

There was scarcely a tree without one or more *P. pedaria* (pilosaria) and *H. leucophaearia* often numbered as many as a dozen. *H. pedaria* (pilosaria) was very lacking in variation, and mostly rather small in size, while *H. leucophaearia* produced nothing beyond the ordinary plain and banded forms and intermediates. The dark unicolorous form that occurs somewhat commonly in Richmond Park and Epping Forest was never seen, nor anything approaching it. No females

occurred and only three of P. pedaria (pilosaria).

These latter were all well out of reach and had to be brought down with a long stick. It is probably due to this habit of ascending at once to the higher branches that accounts for the apparent scarcity of the apterous females. H. leucophaearia flew freely in the sun, and those at rest, unless freshly emerged, were difficult to box owing to their skittishness.

One or two Hibernia marginaria (progemmaria) occurred, also two

quite fair Hibernia defoliaria, and a single Cheimatobia brumata.

As things were so early at Hindhead, I ran down to Chingford for an hour on the 14th to see if *Apochema (Nyssia) hispidaria* was about. Here *H. leucophaearia* was scarcely out, only one freshly emerged specimen occurring, but I succeeded in finding four male *A. (N.) hispidaria*—one very much worn—and the others quite fresh, two of them actually drying their wings. Two *P. pedaria (pilosaria)* and one *H. marginaria (progemmaria)* were the only other moths seen.

A spell of severe cold followed, but on the 21st I picked a nice olive-coloured *P. pedaria* (*pilosaria*), without any markings, off an oak tree at Ongar, and on the 23rd again walked through the forest from

Chingford to Loughton. Two more fresh male A. (N.) hispidaria were taken and another P. pedaria (pilosaria) just out, but H. leuco-

phaearia were still rare—only three seen.

At Ongar yesterday the sallows were almost out, the yellow in the catkins already showing quite strongly on sheltered bushes and the moths are evidently going to keep pace with them as last evening (the 24th) a specimen of Taeniocampa stabilis flew in the house where I am staying. This is a record for earliness, as far as my experience goes, and is nearly two full months ahead of last year, when at Hindhead the sallows were only just ready to work on April 24th.—Russell James, Brockenhurst, Bloomfield Road, Highgate, N. February 25th, 1918.

THE SEASON.—I think it may perhaps be of some interest to record that butterflies are plentiful here (near Chelmsford) this spring. I have seen a good many Aglais urticae and Vanessa io flying in our garden and also in other parts of this town during the past week and both species in very good condition. I also saw on the 20th inst. two good specimens of Pieris rapae flying in the hot sunshine, but these may have emerged in the hothouses and escaped through the ventilators, as one or two have been noticed flying in the hothouses here lately. noticed one P. rapae flying towards the roof of our house, when a sparrow, sitting on the trough, darted at it several times and missed it; then the bird gave it up and allowed the butterfly to fly off unmolested. While travelling in the train on the 21st I noticed three Gonepteryx rhamni within about five minutes, all flying in the hot sunshine on the side of the railway bank, which faces the morning sun, between Shenfield and Brentwood about twenty miles from London. One wonders whether this is going to be a good butterfly year.—(Miss) E. MILLAR, The Croft, Rainsford Lane, Chelmsford. March 26th.

A New Method of Mounting and Preserving in Series.—Dr. Roger Verity, of Florence, has contributed an article to the Bull. Soc. ent. de France, on a new method of mounting and preserving Lepidoptera in series. He points out the great advance which the study has made during the past decade and that the material required for the continuance of this is much greater than hitherto has been necessary. Each locality, each season should be represented, as well as each race. In fact thousands of specimens are necessary, now, where only dozens were wanted before. Such being the case our present system of pinning and arranging in drawers and cabinets is, he says, unnecessarily cumbrous and costly, often necessitating the moving of large numbers of specimens to view the undersides, with the possible chance of much damage. In conjunction with M. Orazio Querci the following method has been adopted by him.

"The butterflies are mounted, without pins, between two plates of glass separated by a small frame formed of squared slips of wood, a centimetre wide, along the margin of the glass plates and keeping them sufficiently apart to allow for the thickness of the bodies of the butterflies. Frame and glass are held by a band of paper attached around the margin and overlapping on to the glass. The butterflies arranged in horizontal and vertical rows are held in place by dark threads, very thin, but strong, stretched on the frame of wood and holding the wings

extended against the upper plate of glass. The vertical threads are arranged in pairs and pass right and left of the bodies of the butterflies; the horizontal threads are single and separate the horizontal rows; in addition, between the various specimens each horizontal thread is fixed to the glass by a small label of paper which serves to number the examples, and in this way all derangement is prevented in a vertical direction, the horizontal thread strongly holding the vertical thread

against the glass."

This plan is claimed to be a great economy in space and expense. The glass frames can be arranged on the shelves of a bookcase. The collection takes up a minimum of space. There is absolute security against mites. Comparisons can be made so much easier. The two surfaces of the wings can be seen with equal facility. The wings can be viewed on a changeable ground. The pin is never in the way of a lens for close examination. All specimens are in exactly similar positions for comparisons. All labels can be placed close to the insect. Dr. Verity concludes by giving further details of the arrangement and methods for converting collections already made.—H.J.T.

WURRENT NOTES AND SHORT NOTICES.

The 23rd Annual Congress of the South-Eastern Union of Scientific Societies will be held in London, under the Presidency of Sir Daniel Morris, K.C.M.G., etc., from Wednesday to Saturday, May 29th to June 1st, 1918. We understand that the Headquarters will be as last year, the rooms of the Linnean Society at Burlington House, Piccadilly, which have been again kindly lent to the Union. On Thursday evening, May 30th, Lieut.-Col. Sir Ronald Ross, R.A.M.C., K.C.B., etc., will open a discussion on the subject of mosquitoes in England. Members of affiliated Societies are admitted to the Congress on payment of 3s., and will receive a copy of the annual volume of the South-Eastern Naturalist. The Programme of the arrangements, list of

papers to be read, and excursions, will be ready shortly.

In the Bull. Soc. ent. Fr. for October last are several interesting and useful notes and articles. M. du Buysson gives particulars of the parasitisation of the nymphs of Coccinella septempunctata, met with on leaves of the vine, by the Dipteron Phora fasciata. M. Peyerimhoff demonstrates in a long series of observations that the Chironomids Ceratopogon species not only attack mammals, including man, but also insects and their larvæ, e.g., species of Culex (Dip.), Cidaria didymata, Erinnys ello (Sphingid) larva, and Meloë (Col.). M. Demaison contributes notes on the various forms of Parasenia plantaginis, viz., var. laemmermanni, var. caucasica, ab. flava, race floccosa, race altaica, race sifanica, var. insularum, var. hatipennis, ab. hospita, and the British race. Dr. Roger Verity gives observations on certain speciës of Zygaena, which Mr. Bethune-Baker is dealing with on another page of this magazine. In addition there are numerous new species described in various other orders, and some biological notes of importance.

The Canadian Entomologist for January contains an account of "A Week's Collecting on Coliseum Mountain, Nordegg, Alta," when such things as Brenthis triclaris, Colias nastes, Œneis brucei, Œ. jutta, Pieris napi, Phyciodes pratensis, Lycaena aquilo, Brenthis chariclea, B. freija, Argynnis meadi, A. lais, Euchloë creusa, Papilio zolicaon, Erebia

epipsodea, E. disa, Brenthis astarte, and many other good insects were met with. Mr. F. H. Wolley Dod contributes the first part of a long detailed and critical article on the recently published "Check List of Lepidoptera of Boreal America," by Barnes and McDunnough, "Geometrid Notes" are continued by L. W. Swett, and deals with the genus Xanthorhoë, describing three new species. Prof. T. D. A. Cockerell discusses the "Bee-genus Brachynomada," and describes a new species

from the Argentine.

The Irish Naturalist for January contains more Entomology than usual. The Rev. W. F. Johnson gives a "List of Aculeate Hymenoptera from the Counties of Armagh and Donegal," and regrets that records of such have hitherto been so scanty. Mr. Thos. Greer writes "Notes on the Lepidoptera of East Tyrone in 1917." Mr. W. H. Workman discusses the great increase of Butterflies and Moths in Ireland during the past summer. Our colleague, the Rev. C. R. N. Burrows acknowledges help with his Psychid investigations and asks for more. Messrs. W. W. Flemyng and J. N. Halbert discuss the occurrence of a living specimen of Agrius convolvuli having been attacked by a Dipteron. The moth was captured at Inchicore, Dublin, in September, 1916, and shortly afterwards no less than 76 examples of Phora rutipes (?) emerged from it while still alive.

In the Ent. Mo. Mag. for January Mr. D. Sharp continues his "Studies in Rhyncophora," dealing in this paper with the British Red Apions, in the course of which he proposes a new genus, Erythrapion, which he describes, and also describes three new species as British, viz., Erythrapion desideratum, differentiated from E. cruentatum, E. fraudator, very close to E. frumentarium, and E. brachypterum doubtfully differentiated also from the last species. Dr. Chapman in the same number gives further observations on the sawflies, ('ladius riminalis and Trichiosoma tibiale,' their egglaying and emergence from

cocoon respectively.

The Naturalist for January contains the "Annual Report of the Yorkshire Naturalists' Union" for 1917. The Report of the Entomological Section consists of more than three pages. Reference is made to the extraordinary abundance of insects; many species generally scarce in the North, such as Vanessa io, have occurred in numbers. Euvanessa antiopa and Agrius convolvuli are among the records; of the former two were taken and of the latter a fair number. Considerable attention has been paid to the Hymenoptera.

In the January number of the *Entomologist* Mr. W. G. Sheldon concludes his observations on *Peronea cristana*, the Messrs. E. and H. Drabble give Notes on the Diptera of Derbyshire, and Mr. J. W. H. Harrison, D.Sc., contributes a series of notes and observations on the rarer species of Hemiptera-Heteroptera in the North-Eastern Counties.

Our colleague, Mr. J. R. le B. Tomlin, during the year 1916, occupied the Presidential chair of the Malacological Society of Great Britain, and his Address to the Society at their Annual Meeting reached us a short time ago. Although the subject, "A Systematic List of the Maryinellidae," is not entomological, yet we must refer to it as a piece of real hard work, which no one, we know from experience, could produce without many months of sheer hard research work, with its verification and reverification and comparison with all original references. We congratulate Mr. Tomlin on the achievement.

79 REVIEWS.

The Bull. Soc. ent. Fr. for November contains for the most part articles on Coleoptera, and a contribution by Dr. Roger Verity, "A New Method of Mounting and of Preservation of Lepidoptera in Series." which we propose to deal with in detail.

SOCIETIES.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

November 19th, 1917.—Paper.—Mr. H. M. Hallett, F.E.S., read a paper entitled "Wallasey and Portheawl Saudhills, a Comparison." The paper dealt chiefly with the Hymenoptera and the Flora of the two localities, and it appeared from the author's observations that Porthcawl was, in point of numbers, a richer locality than Wallasey; this probably being accounted for by its more southerly situation. A discussion ensued, in which Mr. Pierce and Mr. Wilding took part, a vote of thanks, proposed by Mr. West and seconded by Dr. Cotton,

was carried by acclamation.

PAPER.—Mr. F. N. Pierce contributed a paper on "The Lepidoptera of an Essex Garden," in which, after describing the garden and trees, etc., he enumerated some 70 Tortrices, 100 species of Tineidae, besides Pyrales, Plumes, and Knothorns, all having been captured by the Rev. C. R. N. Burrows and sent to Mr. Pierce for setting. The paper was illustrated by some 2,000 specimens, among them being a single example of Unephasia genitalana, a series of both broods of Parornix (Ornix) anglicella, P. torquilella and P. finitimella, Diplodoma herminata and D. melanella; the exhibit was greatly admired and an animated discussion followed the paper.

Exotic Lepidoptera and Coloured Drawings.—Mr. H. B. Prince exhibited exotic Lepidoptera received from the Rev. A. Miles Moss, also an album of watercolour drawings of larvæ of exotic Sphingidae,

executed by the Rev. A. M. Moss from living specimens.

Lepidoptera from Liverpool Warehouses.—Mr. W. A. Tyerman showed a collection of moths which were taken in the neighbourhood of warehouses in Liverpool; four species of the genus Ephestia were represented, viz.:—E. elutella, E. passulella, E. ficella and E. kühniella also Plodia interpunctella, Mellissoblaptes cephalonica and Sitotroga cerealella, all having been more abundant than usual this year.

LEPIDOPTERA FROM DELAMERE AND ALVANLEY.—The Rev. F. M. B. Carr had the results of his collecting in the Delamere Forest district this year; besides the usual species found in the district, the exhibit included a specimen of Plusia moneta bred from a larva found at Tarporley, this being the second record for Cheshire, the other, by Mr. R. Tait, being from Ashton-on-Mersey. Mr. Carr also had a nice series of each of the following, taken in his garden at Alvanley— Plusia iota, P. pulchrina and P. festucae.

Sphinx convolvuli.—Dr. John Cotton exhibited a specimen of

Sphinx convolvuli, taken in a back yard at St. Helens in September.

REVIEWS AND NOTICES OF BOOKS

THE TRANSACTIONS OF THE LONDON NATURAL HISTORY SOCIETY, 1916. Price 2s.—The London Natural History Society, Salisbury House

Finsbury Circus, London, W.C.—This Annual Volume was published during the autumn, and consists of over a hundred pages with Index and one plate. The first thirty pages contain the List of Members, Extracts from the minutes of the meetings giving notes on the various exhibits, the Council's Report for the year, and the various reports of the eight committees and branches into which the Society divides its work. The remaining seventy pages are taken up with the President's

Address and the Papers read at the meetings.

The President, Dr. E. A. Cockayne, in the Address, dealt with the subject of Evolution, summarising the application of Darwin's Natural and Sexual Selection, De Vries' Mutation Theory, Mendel's Theory of Heredity, Galton's Law of Ancestral Heredity, the Determinants of Weismann in his Theory of Heredity, etc. He referred to the advance made in microscopical investigation by modern Cytologists, and discussed Bateson's views on the inheritance of acquired characters. The view is expressed that "it is impossible to doubt that acquired characters are inherited," and the President instanced how "such acquisition of a useful character may readily and rapidly alter a whole species," by pointing out "the rapid spread of melanism in some British Lepidoptera."

Mr. L. B. Prout has an important paper entitled "Some Points of Interest in the Geometridae." He deals with larval and imaginal structures, characteristics and habits in their bearing on classification, he refers to the occurrence of winglessness in the family, and points out that "a very wide and interesting field of investigation is opened up by the numerous and varied 'secondary sexual' structures in the Geometridae, particularly on the legs or wings." The paper is a most

suggestive one for future lines of work.

More than forty pages are taken up by a paper and the subsequent discussion on "Apterousness in Lepidoptera," by Dr. T. A. Chapman. After referring to previous articles and notes on this subject, the writer summarises the phenomenon in "other orders," and endeavours to find out in these orders a cause and origin, which may be applicable in the case of the Lepidoptera. He then tabulates the Palæarctic species under four chief heads.

1. Lay their eggs on or in their cocoons or pupa cases. Emergence of imago in summer (spring and autumn but to the summer margin).

2. Moths appearing in winter or very late autumn, or very early spring.

3. Certain Alpine or mountain species.

4. Desert species.

The sub-groups or species in each of these sections are then dealt with in considerable detail. This is followed by a consideration of the results arrived at by Prof. Poulton in his paper, "External Morphology of the Lepidopterous Pupa: an examination of the question of Degeneration in Female imagines in Lepidoptera." (Trans. Linn. Soc., vol. v., 2nd ser., p. 248, etc.) The paper concludes with a short Bibliography.

The remaining three papers are concerned with bird life.

We must congratulate the Society upon its success as pourtrayed by the *Transactions* year by year, but why not continue to place upon the cover the time-honoured name of the fine little Society from which the present one sprang and of which it is really a continuation, The City of London Entomological Society.—H.J.T.

The Back volumes (I-XXIX) of the Ent. Record, &c. (published at 10s. 6d. net), can be obtained direct as follows—Single volumes, 7s. 6d., except vols. I. and II., which are 10s. 6d. each; of the remainder 2 or 3 volumes, 7s. 3d. each; 4,5,6,7,8 or 9 vols., 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, or more vols. at 6s. 6d. each. Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XXIX, sold separately, price 1s. 6d. each.

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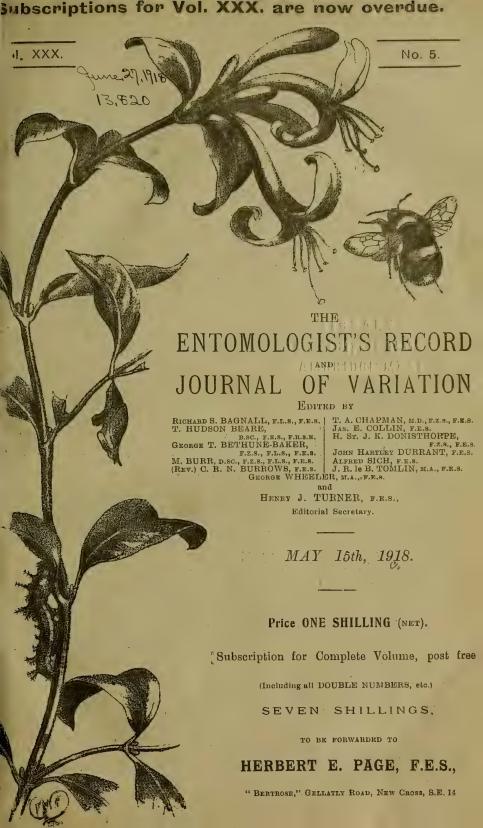
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The Lepidoptera of an Essex Garden.

By F. N. PIERCE, F.E.S.

Picture a large square house, standing back from the road, with a short carriage drive leading to the front door; on the porch large-leaved ivy clings, climbing side by side with rose trees and honeysuckle on the face of the house, peeping in at the windows as they wander at will to hide the somewhat stiff appearance of the early Victorian architecture. It is here in the spring one sees the delicate little Celastrina (Lycaena) argiolus flitting from leaf to leaf, as it seeks a suitable spot whereon to deposit its egg. To the right of the house is a miniature spinny, with a narrow overhung pathway leading to the church. Behind this path is a kitchen garden with a plentiful supply of fruit trees, always a productive spot on an evening's sugaring. To the left we can wander along one of two pathways running parallel with the road, two delightful paths, shaded by the foliage of laburnums, hornbeam, yew, elm, with numerous lilac bushes, whilst in rough rock-like beds daffodils, narcissus and anemones abound; again an ideal treacling ground. At the end we enter a waste field, used until the so-called improvement in educational matters, as a playground for the children attending the little church school. This field is separated from another vegetable garden by a thick myrabolum plum hedge. At one part is a little rustic seat, in front of which grows a large patch of valerian, so that, net in hand, the watcher can sit awaiting the arrival of "Hawks" and "Plusias," which put in an appearance as the dusk settles. Still proceeding up one of the pathways we arrive at the garden proper, a large square grass plot surrounded with a thorn hedge, and a single huge lime tree, planted to shade the house from the glare of the Essex sun. The grass plot itself has a surround of flower beds, in which many rare and lovely flowers thrive and bloom amidst the ubiquitous weeds, that in such a large garden are almost impossible to keep under. Nor must I forget to mention the collection of Artemesias that have been introduced with a view of feeding Phorodesma smaragdaria, and here and there a non-native tree, which seems out of its element and struggles for existence, a poor thin ash, a birch that pines for the moisture of our moss land, tall scrubby fir trees, and a single little bushy oak, perhaps the only one that has accommodated itself to its new home. Such then is the garden of my old friend the Rev. C. R. N. Burrows, at Mucking, in Essex, truly an oasis in the flat, uninteresting (except to the entomologist and botanist) salt marshes. Perhaps we may be permitted to glance into the hallowed sanctuary of the study. We enter by a glass door that leads to the lawn. In front of a window facing the drive is a large leather-covered desk, surrounded by bottles, pocket boxes, spirit lamps, etc., whilst in the centre is a little Leitz dissecting microscope, ready for use. This is the instrument that does all the work. who has had the advantage of the latest prismatic binocular it looks impossible that much can be seen, but it is a true illustration that it is not the instrument, but the user, that produces the marvellous results. The brain versus the machine. To the left is a part of his Entomological library, where we see rows of Entomologists, Records, etc., and a huge ledger labelled Index Entomologicus. This huge tome is the great index. Does Mr. Burrows want a reference, he turns up the species, May 15th, 1918.

then he can run his eye down—argiolus, egg described "Ent.," so and so page; first capture in Mucking; the date; recorded as feeding on Portugal laurel, Ent. Record, etc., etc. A marvellous accumulation of references that has taken a life time to gather, and which if published would be invaluable to the working entomologist. To the right is a large oak cabinet, with pigeon-holes, spaces for his large microscope. store-boxes, and all the impedimenta of a working naturalist. A large slide cabinet, originally filled with the collection of mites, which Mr. Burrows has since presented to the Lister Institute, but now holding his wonderful collection of genitalic slides of the Geometers, series of both English and Foreign species, to throw light on species represented in England by single species, mostly provided by Louis B. Prout. cabinets there are two, one an upright mahogany one, containing the butterflies, hawks, Bombyces, and Noctue; the other of black oak, in the form of a sideboard, with the Geometers, Plumes, Pyrales, and Crambides.

Early in 1916 Mr. Burrows conceived the idea of working his garden for Micros, visiting at various times the long fence at the bottom of the garden, and also sweeping and netting the various hedges and plants. The captured moths thus obtained were killed and pinned and sent almost daily to me. These were relaxed and set as they arrived. During 1916 about 2000 specimens were obtained, and this year (1917) this number has been even exceeded. The result has been the introduction of one new species to England, viz., Parornix finitimella, Zell. I should explain that Mr. Burrows took what came to hand, and not being a microlepidopterist did not trust himself to discriminate. Tortrices and Tineæ received most attention, but the boxes sometimes contained odd specimens of the Macro-Micros. One of the most interesting was Nephopteryx spissicella, a well known oak feeder, and therefore not expected in that locality; two specimens form a new addition to the Mucking list. Homoeosoma sinuella is another species taken, including a nice whitish variety. Amongst the Knothorns were two very small specimens that bothered us. I submitted them to Mr. Thurnall, who said they were new to him. These proved to be very late, if not second brood, Euzophera cinerosella, a species Mr. Burrows takes in his garden. Achroea grisella, one specimen, is another curiosity, as all the bees of Essex have been exterminated with the Isle of Wight disease.

In the Tortrices we have Tortrix podana, T. rosana, T. ribeana, and T. xylosteana common; a rather well marked form of T. unifasciana, which seems to me to perhaps account for the inclusion of Dichelia gnomana in our lists. One T. forsterana, a couple of Ptycholoma lecheana, and some fine forms of Batodes angustiorana represent the group Tortrix. The Cnephasias received much attention. In all some 300 specimens were set, tho four common species being Cnephasia subjectana, C. virgaureana, C. pascuana, and C. longana (ictericana). The three former being very variable and running into each other in wingmarkings so closely as to make it imperative to examine the genitalia of each specimen before definitely deciding on the species. In doing this I came across one of those monstrosities, of which Mr. Burrows has already discovered four specimens, viz., 'Acronicta psi, Hydroccia nictians, and two Fumea casta, showing the absence of the valvæ externally, these being unextruded and internal. A full account of this malfor-

mation and the reproduction of it, by injury of the larva, has been dealt with by Dr. Chapman in the Trans. of the Ent. Society of London.

The C. longana series is particularly interesting, and differs much from last year's take. There seem to be two races, one the large ordinary yellowish form, and a much smaller silvery white form. This at first might be thought to be bleached, but bleaching would not reduce the size; this small form would appear to be abundant this vear. Some six or seven Unephasia chrysantheana with numerous U. nubilana complete the list, except for one prize, a specimen of the new C. genitalana. One in 300! Last year (1916) in about the same number there were three specimens; the form taken at Mucking might easily be passed as a specimen of C. subjectana or C. pascuana. Olindia ulmana, Argyrotowa conwayana, Dictyopteryw loeflingiana, D. holmiana, D. bergmanniana, and D. forskaleana show that this genus is fully represented. One specimen of Tortrix viridana! the only one seen, shows this species to be a great rarity in the vicinity. The Peroneas poorly represented, three forms of Peronia variegana, and a single specimen of P. sponsana being the only ones seen; Teras contaminana occurs abundantly, with many lovely varieties. The Conchylidae produced two specimens of Phtheochroa rugosana, Xanthosetia hamana commonly (by the way, what has become of its brother, X. zoegana? I used to take it at odd places commonly; now I never see it). Eupoecilia dubitana, one specimen of E. angustana, and although not exactly from the garden, Mr. Burrows sent me a nice series of E. affinitana from the saltings. Conchylis smeathmaniana was abundant, and amongst the series I detected one specimen of C. francillana. In the Penthinas a lovely series of Antithesia salicella (not actually out of the garden), Penthina pruniana and P. variegana were common; of the latter was a very handsomely marked specimen of the var, nubiferana, which I had not seen before, and could hardly realise it as belonging to the genus at all. A single specimen of P. ochroleucana occurred.

In the Spilonotidae, Sericoris lacunana and Orthotaenia striana were The Grapholithidae are represented by Bactra lanceolana, Paedisca corticana, Ephippiphora trigeminana one specimen, the only Phoxopteryx being P. achatana. A single Grapholitha penkleriana and another of G. nigromaculana are augmented by countless thousands of every form of G. trimaculana. These Mr. Burrows found so numerous that he had to exercise a censorship, otherwise we should have been overwhelmed. Hedya ocellana was abundant with its numerous varieties; H. dealbana occurred sparingly with its dark var. alnetana. H. aceriana also put in a modest appearance, and occasional specimens of Spilonota trimaculana and S. roborana and Pardia tripunctana. Aspis udmanniana was represented by two specimens. A single specimen of Retinia buoliana was a curiosity, as with the exception of one or two fir trees in the garden I saw no others in the neighbourhood. A single Catoptria citrana, another of C. hypericana, with numerous C, fulvana, C. scopoliana, and a single C. cana, represent the The Dichroramphas produced numerous Dichrorampha Catoptrias. petiverella, with some very fine forms of its variety flavidorsana, a nice series of D. plumbagana, a single specimen of Stigmonota compositella, one only last year, probably indicates it is difficult to see and capture; two S. regiana, with numerous Semasia janthinana, complete the list of

this year's takings. To this must be added a single specimen of Penthina betulaetana taken last year, also a single Eupoecilia atricapi-

tana, and a solitary Chrosis alcella.

The Tinea are equally well represented. Perhaps the most interesting find has been the Psychid Xysmatodoma melanella, Mr. Burrows' sharp eyes detecting numerous examples of the moth as well as the lichen-covered cases of the larva and pupa. This year Mr. Burrows successfully reared Diplodoma herminata from a neighbouring fence, whilst Fumea casta, Solenobia inconspicuella, and Luffia ferchaultella turned up by the same assiduous search. Ochsenheimeria vaculella put in an appearance in the garden, but O. birdella required a visit just down the lane, where quantities of goosefoot (Atriplex) This species has the reputation of being very difficult to catch and only flying at stated times. Mr. Burrows seems to have found it "at home" as often as he went for it. In its company he secured a fine specimen of the brilliant little Tinea argentimaculella. Scardia granella were in abundance; Blabophanes ferruginella was rare, but five specimens were secured against one last year; B. rusticella was common; Tinea tapetzella was a prize, one each year in the outhouses; T. lapella, fine large well-marked specimens; a single very small T. semifulvella, corresponding with a slightly larger specimen in 1916; Lampronia praelatella was common on the plum hedge in the spring: Incurvaria musculella were common and included a specimen I have so far been unable to identify. It is dark, with a long dorsal blotch, reminding one forcibly of the true Paedisca solandriana type.

The Adelas are represented by Nemophora swammerdammella and the gorgeous Nematois fasciella. The Swammerdammia turned up strong and again require the aid of the genitalia to really satisfactorily determine the species, S. combinella, S. caesiella, S. lutarea, finishing with a couple of S. pyrella. By the way, we have too many species in our lists. Meyrick is right in coupling S. oxyacanthella and S. lutarea, and S. caesiella with S. spiniella. The Hyponomeutas produce three species, Yponomeuta padellus, H. cagnagellus, and H. evonymellus; whilst the light form of Prays curtisellus turned up in two specimens. Plutella cruciferarum was common, Cerostoma vittella in profusion, with some well-marked varieties. Harpipteryx xylostella, on the other hand, claims a place by reason of one specimen only. The Gelechiidae are well represented but hardly worked out yet, Phibalocera quercana, was represented by fine beautifully marked specimens, Depressarias would be well represented but occur rather too late for Mr. Burrows' operations. Single specimens of Depressaria purpurella, D. liturella, and examples of D. arenella, D. applanella, D. subpropinguella were taken, whilst D. zephyrella appears to be common. The curious little Cladodes gerronella turned up sparingly, as did examples of Ceratophora rufescens; Oecogenia quadripunctata is evidently much at home and I have some very beautiful specimens of this moth; a single example only of Harpella geoffrella was taken; Dasycera sulphurella, as one might expect, is abundant among rotten wood: a nice series of Oecophora lunaris, Oe. fuscescens, Oe. fenestrella, Oe. pseudospretella, and single examples of each of Oe. unitella, and Oe. augustella. At the Tinea birdella spot Mr. Burrows secured nice specimens of Nannodia hermannella and its satellite N. stipella. One of the most beautiful and abundant species was Poecilia albiceps, the rich black and white mark-

ings of this lovely species being much in evidence. A long and variable series of what I take to be Lita instabilella were obtained from the saltings. Teleia vulgella and T. fugitivella were abundant, with odd specimens of Recurvaria nanella, R. leucatella (one last year), Bryotropha terella, B. domestica, Lita fraternella, L. maculiferella, L. hübnerella, Anarsia spartiella, and Gelechia sororculella completes the Gelechias as far as I have them named, though there are several other species. Argyresthias, as one would expect, were very numerous, Argyresthia ephippella, A. albistria, A. nitidella, with its white var. ossea (Haworth), A. mendica, A. curvella, with an odd specimen of A. goedartella and one A. brockeella show that they were not neglected. In order to test the occurrence of Parornix finitimella, Mr. Burrows neglected no opportunity of capturing specimens of this genus; in all, 108 specimens were secured and set. By far the most abundant was Parornix anglicella, then in point of numbers P. finitimella made a good second, with P. torquilella by no means common. Mr. Burrows obtained specimens of both broads of these three species. With the series now separated out by genitalia it is possible to see what a handsome species P. finitimella is, though here again are two specimens so different that I am inclined to mount them to see if there is not another species only awaiting discovery. I had hoped to duplicate the single example of this genus sent me by Mr. Whittle, of Southend, which so far is the only British example of the two specimens that form, with the type specimen of P. finitimella, Zeller's series of three specimens over the label P. finitimella. These three (Whittle's one and Zeller's two specimens) are a perfectly distinct species and are so far unnamed and undescribed. I hope to deal with them in a forthcoming paper on the genus Parornix, when I propose to give a plate showing how easily the different species may be separated by the

Gracilaria syringella was in profusion, with some magnificent dark varieties. The Coleophora are represented by many species, but only a few are worked out so far. The very lovely bronzy green Coleophora deauratella, the white C. anatipennella, C. fuscedinella, C. annulatella, C. lutipennella, C. salinella and C. caespititiella, the latter evidently from the rushes in the adjoining marsh-land. These, with single specimens of C. conyzae and C. lineola, being all so far determined. The same may be said of the genus Elachista. Mr. Burrows was greatly pleased at turning up a single example of Chrysoclysta linniella, a species he knows well, and has often searched for in vain at Mucking. Batrachedra praeangusta was numerous, as was Laverna atra, Chauliodus chaerophyllellus, only one specimen, Elachista rufocinerea common, with several specimens of the lovely white E. argentella, and some few examples of Tischeria marginea, with a single Elachista atricomella. In Lithocolletis, L. cramerella, L. spinicolella, L. messaniella, L. pomifoliella, L. schreberella, L. lantanella, L. scopariella, L. sorbi, L. corylitoliella, occurred with hosts of L. trifasciella, among which I detected one with a strange genitalia, which will possibly prove to be one of the nearly allied species. A single specimen of Lyonetia clerkella hid itself for some time amongst the Cemiostoma laburnella and C. scitella. A couple of specimens of Bucculatrix boyerella brings us to the difficult group Nepticula, of which the only specimens so far I have been able to identify are Nepticula trimaculella and N. crataegi. Of the Pterophoridae only four species have been included Platyptilia ochrodactyla (bertrami) Stenoptilia (Mimaeseoptilus) bipunctidactyla, S. (M.) pterodactyla and Oidaematophorus (Pterophorus) monodactylus, of which he has sent me both the grev and brown forms.

This shows what can be done by systematically collecting even in a garden—provided that garden is in such a favourable locality as the

Essex marshes.

Some New Australian Ants.

By W. C. CRAWLEY, B.A., F.E.S.

The following paper contains descriptions of new species of Ponevinae, Myrmicinae, Dolichoderinae, and Camponotinae, captured by Prof. E. B. Poulton, Mr. G. F. Hill, and others in 1914-16. Those taken by Professor Poulton include the true female of Euponera lutea, Mayr, entirely different from the ant described as such by Mayr, who qualifies his determination by the words "probabiliter ad hanc speciem pertinens." Either Mayr's ? (an ant continually occurring in collections without accompanying \(\xi \) s), should be referred to another species, or the new 2 (taken with the \(\sigma \) s in the nest) must be considered as a B form.

Sub-fam.: Ponerinæ.

Euponera (Brachyponera) lutea, Mayr. (Hitherto undescribed.)

L. 7mm.

Rather lighter castaneous brown than the &, which it very much resembles; the upper surface of thorax darker than the rest of the body. (Mayr's ? is almost

entirely black.)

Mandibles triangular, proportionately longer than in the &, terminated by a large tooth, which is preceded by two smaller blunt teeth; the rest of the terminal

border irregular, but not properly dentate.

Head as broad as long, narrowing somewhat behind, where the occipital border is nearly straight; clypeus flatter than in the &, with a shallow longitudinal groove, the anterior border feebly convex; frontal carinæ as in the &; eyes large (larger in proportion than in Mayr's ?), placed close to the anterior border of head; ocelli large (also larger than in Mayr's ?).

Thorax longer and narrower proportionately than in Mayr's ?, narrowing very slightly behind the wings; anterior border of pronotum less convex, and angles more shouldered; scutum of mesonotum longer than broad; there is hardly any angle between the two surfaces of epinotum, and the fall of the declivity is much less abrupt than in Mayr's 2. Scale seen from above, twice as broad as long, convex in front, straight behind; seen in profile, slightly inclined forward at the top, and convex behind from the half-way line to the apex, which is much narrower than at the base; it is as high as the first segment of gaster. It thus approximates to the form of the scale in the &, and is quite unlike the extremely thin scale of Mayr's ?. Gaster similar to that of the &, and more pointed than

Mandibles smooth and shining, with scattered punctures. Upper surface of head closely and very finely punctured, the punctures cover the frontal carinae, but do not extend to the sides of the head, nor to the space between the frontal carinæ and eyes; clypeus opaque but not sculptured; under surface of head smooth and shining. Back of thorax much more shining than the head, and with fine punctures, which are much less numerous than on the head; sides of thorax and declivity of epinotum mostly smooth; scale smooth, gaster shining and with

exceedingly fine puncturation.

Antennæ and legs with a fine yellow pubescence; head, and particularly the gaster, with a longer yellow pubescence. Antennæ without erect hairs; tibiæ with erect hairs only on the under surface. The whole body furnished with long hairs, dark on thorax, yellow and particularly long and abundant on the scale and gaster.

The $\mathfrak P$, doubtfully attributed to this species by Mayr, is considerably larger, measuring 10 mm. in length, and black in colour, whereas the above-described insect is similarly coloured to the $\mathfrak P$, which it resembles otherwise very closely. It was taken with the whole nest of $\mathfrak P$ s under a stone (Nest E) on Aug. 1st, 1914, Picton Junction, nr. Perth, W. Australia. It is noteworthy that a single specimen, without $\mathfrak P$, of Mayr's $\mathfrak P$, was taken in the Perth district by H. M. Giles in 1914, about the same time, and 1 $\mathfrak P$ with 5 $\mathfrak P$ s (Mayr) also without $\mathfrak P$, on Aug. 3rd, 1914.

The \mathcal{J} taken in a different nest of *E. lutea*, and which I hope to describe later, is also entirely different in size and form from the \mathcal{J}

described by Mayr as belonging to this species.

(2) Rhytidoponera (sensu stricto) foreli, sp. nov. \$.] L. 5.7 mm.

Dark brown, almost black; mandibles, scapes, legs and apex of gaster redbrown.

Head much longer than broad, with feebly convex sides, widest at cheeks, narrowest at occiput, which is deeply emarginate and produced into acute angles.

Mandibles large, broad, and minutely denticulate, the denticles increasing in size towards the apex. Clypeus convex, with the anterior border obtusely angulate; frontal area deeply impressed. Frontal carinae converging behind, with a small angle in the middle at each side; they extend half way to the occiput. The antennal scapes extend for nearly half their length beyond the occiput; the second joint of funiculus somewhat longer than the first, and more than twice as long as broad; all the joints are longer than broad, the last twice as long as the penultimate. Eyes situated immediately behind the middle of the sides of the head, medium-sized, and very prominent.

Thorax hardly, if at all, wider in front than behind; pro-mesonotum only slightly convex; there is a slight emargination between the meso- and epinotum. Pro-mesonotal suture distinct and angular. Teeth at the inferior angles of pronotum small. Base of epinotum nearly flat, passing by a very obtuse angle to the declivity, which is shorter than the base, and hollowed to receive the petiole. The node of the latter viewed from above, broader than long, with convex sides; viewed from the side, slightly higher than the angle of the epinotum, rounded and somewhat narrower at top, and underneath in front armed with an acute, almost vertical, spine. First segment of gaster rounded in front, where it is narrower than behind, shorter than the second segment. The ventral lamella of first gastric segment is produced into a blunt projection beneath the petiole.

Mandibles finely and densely striated longitudinally. Clypeus coarsely reticulate-punctate, the bottom of the punctures perfectly smooth and shining, without any trace of reticulation; on the occiput the punctures have a tendency to merge into each other. The whole of the back of thorax sculptured like the vertex, with the exception of the front of the pronotum, which has a few irregular transverse lines. The sculpture on the sides of the thorax becomes finely reticulate in patches. Scapes and anterior tibiae finely striate longitudinally, the anterior coxae circularly striate. Node of petiole coarsely rugose transversely, but the sculpture is less

coarse than that on the thorax.

First segment of gaster finely striate transversely, the striae on the base of the segment semicircular, curving round the sides until they reach the anterior margin; second segment very superficially striate, the lines assuming more of a horseshoe form than those on the first segment. The remaining segments faintly reticulate.

The whole body covered with short erect hairs; scapes and tibiae with short erect hairs; apical section of gaster fringed with longer hairs. The effect of the polished sculpture is to give the whole insect a shining appearance under a lens.

Koolpinyah, Northern Territory, 1915 (G. F. Hill). No. 589.

(3) Rhytidoponera (Chalcoponera) numeensis, Ern-André, subsp. borealis, subsp. nov. &

This ant agrees very well with André's description of R. (C.) numeensis from New Caledonia, but differs in being smaller (4.0 mm. as against 5-5.5 mm.), and in the following characters:

Clypeus hardly, if at all, produced between the mandibles, its longitudinal rugae irregular, with faint reticulation between, this reticulation covering all the

space between the coarse pits and rugae of the head, thorax and node.

On the first segment of gaster the semicircular striae are almost lost in the dense and fine reticulation that covers this segment, which has in addition the fossae, some of them elongate, of numeensis. The second segment, as in numeensis, finely and semicircularly striate with scattered shallow fossae.

The head is longer than wide, and widely emarginate behind; the antennae

extend a fifth of their length beyond the occipital border.

Thorax widest in front, the inferior angles of pronotum with short teeth. Back of thorax regularly arched, descending to the declivity of the epinotum by a

very obtuse angle.

Node of petiole, viewed from above, wider than long, convex in front and nearly straight behind; viewed from the side, both edges are straight; underneath the petiole is a flat process with a tooth at each angle. Pilosity and colour as in numeensis.

Stapleton, Northern Territory (G. F. Hill). No. 641.

(4) Rhytidoponera (sens. str.) reticulatum, Forel.

This species is very characteristic owing to the shape of the node. Workers were taken by G. F. Hill in the act of carrying off winged termites after a shower of rain.

Darwin, Northern Territory, Oct. 16th, 1915. No. 672.

(5) Rhytidoponera (Chalcoponera) metallica, Sm. \ ₺.

Aug. 10th, 1914. Adelaide, Mt. Lofty Range. These &s taken from Nest L. by Prof. Poulton, might be considered as a variety of the typical metallica. They are a uniform dark metallic green, and the coarse long striae on the front do not continue so far as in the typical form. The scale also is straight, not concave behind, and the first segment of gaster has shallow punctures amongst the fine striation, and the second segment is similar, but the punctures are fewer and The anterior border of clypeus approaches more to a pointed form than in the typical metallica, and the head is not quite so emarginate behind.

(6) Rhytidoponera (C.) victoriae, Ern-André.

Six &s and two &s were taken by Prof. Poulton under a log (Nest M.), Aug. 15th, 1914, Victoria, in Healesville.

The 3 of this species, which is not described, I hope to describe

later.

(7) Rhytidoponera (Chalcoponera) metallica, Sm. var. cristulata, Forel. 3. (Hitherto undescribed).

L. 7.5 mm.

Black; tarsi dark ferruginous, wings pale brown, nervures dark brown. Mandibles triangular, dentate. Clypeus swollen behind, the anterior border convex, with an impression running parallel with, and close to, the border. Antennal carinae short and divergent.

Antennae long, the scape much shorter than the second joint of funiculus, all the joints of which, except the second, are much longer than broad. Head longer than broad, widest behind the eyes, the occipital border feebly

concave.

Thorax; Mayrian furrows deeply impressed; the declivity of epinotum longer than the base, with a faint raised border surrounding it; a slight angle separates the two surfaces.

Petiole, from above, is longer than wide; in profile, it is surmounted behind

with a rounded node, and beneath anteriorly bears a pointed process.

Gaster elongate, with a distinct constriction between the first and second

Mandibles densely and finely striate, with a few elongate punctures. Clypeus longitudinally rugose, with a fundamental fine reticulation. Mesonotum coarsely reticulate between the Mayrian furrows; this reticulation extends beyond the furrows and merges into a fine longitudinal striation.

Scutellum longitudinally rugose-striate; base of epinotum coarsely rugose

transversely, the declivity more finely so. Node transversely rugose. First segment of gaster finely striate transversely on the anterior portion, the centre of the base (in one specimen) having longitudinal striae (absent in the other specimen); the remaining segments microscopically striate transversely.

The whole body with plentiful long reddish erect hairs, the tibiae with erect

hairs. Anterior legs and gaster with a fine grey pubescence.

Two specimens (Nest R.) taken in nest with \(\negthigs\), Aug. 23rd, 1914, Blue Mountains, N.S.W., near Mt. Victoria, by Prof. Poulton.

- (8) Rhytidoponera (C.), sp. nov. (To be described later.) \u225. July 31st, 1914, near Perth, W. Australia (E. B. Poulton).
- (9) Rhytidoponera (C.), sp. nov. (To be described later.) \(\neq \delta \). August 23rd, 1914, Blue Mts., N.S.W. (Nest R.) (E.B.P.)

Sub-fam.: Myrmicinæ.

(10) Meranoplus minor, sp. nov.

L. 2.7-2.8mm.

Castaneous; gaster palest, clubs of antennæ, vertex and nodes, darkest. Terminal border of mandibles edged with dark brown.

Mandibles quadridentate. Frontal area triangular, in some specimens very indistinct. Clypeus bidentate, not deeply emarginate between the teeth.

Head square, upper surface regularly convex, sides parallel, occiput hardly concave; scapes swollen towards the apex; posterior halves of frontal carinæ parallel, anterior halves curving inwards and forming a blunt projection on each side of the

clypeus; the scrobes extend about an eye's width beyond the eyes.

Pro-mesonotum wider than long, terminated in front by two flat triangular teeth, each lateral border has a broad shallow excision in front, and two deep circular ones behind, the posterior angles terminating in two long blunt teeth which curve inwards; the sides are in addition furnished with flat transparent plates, subparallel, which cover the excisions. The posterior border of mesonotum, which is broadly concave, has a wide and shallow excision in the centre, which is also covered with a membranous plate. Epinotum vertical, with two straight spines in the middle of the sides, the spines are directed outwards, and are shorter than the interval between their bases.

The first node of the pedicel wedge-shaped, its superior border horizontal; second node, seen from above, feebly convex in front, and strongly so, almost angular behind; in profile regularly convex from below to the apex, and concave behind,

forming a slight overhanging lip.

Gaster broad and pointed, emarginate at base.

Mandibles striate; clypeus superficially coriaceous, with two or three broken longitudinal ridges. The upper surface of head with longitudinal parallel ridges,

somewhat wide apart; below the eyes are similar ridges, but behind the eyes and between them and the base of the mandibles the ridges are broken up by cross bars. The pro-mesonotum has similar sculpture to the head, but the ridges are less regular, more vermicular, broken here and there by cross bars. Both nodes have a few broken ridges on their upper surfaces, and a few longitudinal ones on their posterior surfaces. In addition, the entire body, including the scapes and legs, is covered with an extremely delicate fundamentual reticulation, which is most distinct on the head and gaster (which latter has no other sculpture), and faintest inside the scrobes and beneath the projecting plates of the thorax, and on the epinotum.

There are a few long stiff hairs on the front of the clypeus, and the whole body, including the legs and antennæ, is furnished with short, stiff, erect hairs, which on the antennæ, legs, and under surface of the gaster are pale testaceous, and on the rest of the body, brown. Pubescence nil.

Koolpinyah, Northern Territory, April 6th, 1915. (G. F. Hill, no. 603.) Nest in small hole on a gravel ridge.

Sub-fam.: Dolichoderina.

(11) Iridomyrmex emeryi, sp. nov.

L. 3.5mm.

Black; tarsi, basal half of scapes, and mandibles, ferruginous, the tarsi palest. Gaster with a bronze sheen. Some specimens have a faint iridescence on the head.

Mandibles triangular, terminated by a long curved tooth, which is preceded by five or six large and small ones. Clypeus convex in centre, the anterior border widely and shallowly emarginate. Frontal area triangular, fairly distinct, not impressed. Frontal carinæ short and parallel.

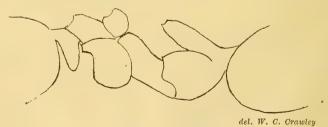
Head sub-triangular, longer than broad, widest just behind the eyes, sides convex, occipital border feebly concave, almost straight. Eyes flat, placed in centre

of sides. The scapes extend just beyond the occiput.

Pronotum nearly as broad as long; mesonotum narrow, about twice as long as broad, sloping downward to the base, where the stigmata are prominent; there is a deep narrow impression between the mesonotum and epinotum, and the base of the latter rises high above, rounded in profile, the declivity, which is concave at the base, descending sharply; seen from above, the base is longer than wide, and narrower at apex; scale high, but lower than epinotum, somewhat thick, feebly convex in front, straight behind; seen from above, is more than twice as broad as long. Gaster a rounded oval, not overhanging the scale.

The whole insect somewhat shining; mandibles punctured, head, thorax and

gaster microscopically reticulate.



THORAX OF IRIDOMYRMEX EMERYI & SP.NOV.

A grey pubescence is fairly abundant on the sides of head, thorax and gaster; mandibles with abundant hairs, a few long ones on occiput, pronotum, epinotum, and borders of apical gastric segments.

9. L. 8-8.5mm.

Colour as in ξ , but no trace of metallic sheen; the antennæ, however, are almost entirely ferruginous, and the legs more so than in the ξ , and the borders of the segments of gaster are edged with a thin but distinct greyish-white margin.

Mandibles and clypeus as in \$\frac{1}{2}\$, but the whole head is broader behind and much more narrowed in front, and there is an impressed line from the frontal area to the anterior occllus; the occiput border is almost straight. The eyes also are more

prominent than in the &.

The thorax is distinctly impressed between the scutum and scutellum of mesothorax; there is hardly any angle between the two surfaces of the epinotum, which, seen in profile, shows the upper 3 evenly rounded, and the lower quarter concave; seen from above the segment is broader than long, and is somewhat broader in front than behind. There is a distinct central longitudinal impression near the upper border of epinotum. The scale is much broader and flatter than in the &, is slightly convex in front, and flat or concave behind; the superior border rises to a feeble angle in the centre.

Gaster elongate-oval, large, nearly as long as the rest of body.

Sculpture and pilosity as in \u2212. Pubescence more abundant, particularly on the head, epinotum and gaster, on the latter it is most plentiful on the borders of the segments and beneath, giving the whole segment a silvery sheen. Wings slightly infuscate, the upper with two closed cubital cells.

3. L. 3-3.3 mm.

Black, with a distinct metallic blue sheen; antennae and legs fusco-ferruginous, tarsi testaceous.

Mandibles narrow, pointed, edentate, almost straight. Clypeus broad, arched,

the anterior border entire, feebly convex.

Head depressed, about as broad as long, narrowing behind the eyes, which are large, prominent, and placed slightly in advance of the middle of the sides. Frontal carinae indistinct; scape shorter than the second joint of the funiculus, and all the joints of the latter, except the first, longer than broad.

Scutellum in profile high and rounded, almost overhanging the epinotum; seen from above, it is narrowed and rounded behind. Base of epinotum in profile, rounded, the declivity, which is much shorter, is nearly vertical; epinotum seen from above is longer than broad, slightly narrowing and convex behind; in the centre of the base is a deep and broad impression. Scale small, broader than long, convex in front and straight behind, from both aspects; gaster small and oval.

Mandibles shining, with a few punctures. Sculpture of rest of body similar

to, but fainter than, that of the other sexes.

Pilosity similar, except on scutellum and epinotum, but sparser. Pubescence fairly plentiful on the whole body.

Neuration. Upper wing with one closed cubital cell.

Nests M. and N., under stone, Victoria, in Healesville (E.B.P.). Emery considers this species nearest his I. calvus, from New Caledonia.

(12) Iridomyrmex, sp. A single &, Yallingup to Mammoth and Lake Caves, under log or stone in bush, July 31st, 1914 (E.B.P.). This ant does not agree with any of the published descriptions of the genus, but in default of further material it is perhaps better to leave it undescribed at present.

Sub-fam.: Componotinae.

(13) Camponotus (Myrmosaga), sp. A single \(\preceq \) media which

appears to be an undescribed species, but I prefer to wait in the hope of further material before describing it.

(14) Camponotus (Myrmogonia), sp. \(\forall \) s minor. In default of soldiers I propose to give a brief description of this ant, which I cannot trace in any published description, though it appears to come close to Forel's gibbinotus.

L. 7-8 mm.

Dark castaneous, pronotum and anterior half of head clearer, antennae and

legs clear testaceous. Basal borders of gaster segments testaceous.

Mandibles 5-6 dentate, clypeus carinate; head longer than broad, with parallel sides, narrowing behind the eyes, the occipital border feebly emarginate.

The whole thorax in profile forms a high and regularly curved arch, the base

of epinotum sharply compressed. The whole body is superficially and transversely reticulate-striate.

Body with a few stiff erect hairs, none on the scapes, and on the tibiae only on the underside.

Under log or stone in bush, Yallingup, July 31st, 1914 (E.B.P.).

Anopheles and Malaria.

Malaria is due to the presence of the terrible little parasite discovered by Laveran, a French medical man, some thirty years ago, and called Laverania malariae.

In the spread of Malaria the part which the mosquito plays is that of a carrier of the young parasites or spores, which are present in large numbers in the saliva of the mosquito. Thus, when the Anopheles bites a human being to feed upon the blood, some of this saliva carrying spores enters a minute capillary through the wound. The spores thus introduced into the circulation immediately attack and penetrate the red corpuscles of the blood, where they develop and multiply. This multiplication of the spores, by simple division or splitting, is termed "Schizogony," and the spores are themselves called "Enhaemospores." The attacked corpuscles are destroyed, setting free spores which attack other corpuscles. Sexual forms of the parasite soon appear in the blood of the infected person and pass into the next mosquito, which bites the sufferer to feed upon the blood. These male and female forms are sausage-shaped when transferred to the alimentary canal of the gnat (Anopheles), but in a short time become sphericle. The male form produces spermatozoa, which fuse with and fertilise the female spheres or egg-cells. A series of metamorphoses then ensues in which a wormlike form partly pierces the intestinal wall and is nourished by the gnat's blood. Cysts are formed which finally break up and produce fresh spores, which accumulate in the salivary glands in the body of the affected mosquito, ready to still further spread this fell disease. This second spore production is known as "Sporogony," and the spores produced are termed "Exotospores," to distinguish them from the former series.

Thus the parasite is absolutely dependent upon the mosquito for part of its development, and the moral therefore is "Do away with the Anopheles and you do away with the parasite." In order to do this the carrier of the parasite must be located, and this is the task which the Local Government Board want to carry out; to map out with all

accuracy the area of distribution of Anopheles maculipennis in these islands.

A curious fact is, that if these sausage-like sexual forms had been swallowed by a common gnat or mosquito of the genus *Culex*, they would have been digested and destroyed. It is only in the gut of *Anopheles* species that the parasite can undergo its sexual union and development—.H.J.T.

SCIENTIFIC NOTES AND OBSERVATIONS.

TRIENA (ACRONICTA) PSI AND T. TRIDENS.—I have been asked to differentiate between the imagines of these two species. South says of T. tridens, Moths of Brit. Isles, Ser. 1, p. 195, in 1907, "I am unable to indicate any character that will serve to distinguish this moth from T. psi." I think this is the feeling of most of us. Tutt, Brit. Noct. and their Var., in 1891, vol. i., p. 17, on the other hand, from information "derived almost entirely from Dr. Chapman," goes into more than a page of detailed points of differentiation, at the same time he remarks, "It is well known, however, that the markings of both are so similar that very few Lepidopterists can separate them with any degree of satisfaction." Barrett, in 1896, Lep. Brit. Isles, vol. iii., p. 245, says, "The description of A. tridens is also that of A. psi so very nearly that the only advantageous course appears to be to point out the slight distinctions." These he goes on to enumerate. In A. psi, "The thorax and abdomen seem to be slightly more robust and the shoulders a little more square; forewing slightly broader and more triangular; the ground colour of a colder grey—devoid of either pinkish or yellowish tone-but varying from whitish-grey to shades very much darker than are observed in A. tridens. The second line of the forewings at its origin on the costa, runs at first more parallel with that margin, and so, as it bends, makes a broader and more squared curve above the middle of the wing. Costal spots usually rather less distinct. In the female the hindwings are usually more smoothly and generally suffused with brownish-grey, which in some instances is quite dark." "A. psi is also very much more variable in ground colour than the last, from a whiter-grey to a deep slate-grey or grey-black, but the markings are always distinctly deeper black and, in the vast majority of instances, the ground colour, whether darker or paler, is uniform." Nearly all these points appear to be of that class of difference which one sees in two undoubtedly rightly named series of specimens when placed side by side, but which when applied to separate a number of examples of the two species mixed together, leaves a very considerable margin of doubt. and a decision one always feels liable to be reversed at any time. Dr. Chapman, quoted by Tutt, Brit. Noct. and their Var., says, "When you look for any marking apart from tint and tone, to separate psi from tridens, I must confess that I have been able to find none that has been invariable." He also adds a very pregnant remark, "It is curious how similar varieties affect these species." Dr. Chapman refers to the shortness of the dagger handle in psi, and the whiteness of the wings in the male, but these do not hold universally. The double mark in the fringe at the anal angle at the end of the dagger, exaggerated consists of two lines in psi, two blotches in tridens, but this fails frequently,

and is not distinct enough. Tutt adds, (1) The dark shade on the costa between the stigmata differs in the two species. (2) The transverse line parallel to the hind margin is distinctly double in tridens, but the inner edge is to a great extent lost in psi. (3) Lower part of this line generally nearly vertical or slightly turned back in psi. (4) Line in the fringes, inner half ochreous and outer half whitish in tridens. in psi the inner half is not ochreous but darker gray than outer. (5) Hindwing of psi darker and more or less traces of the dark transverse line, which is rarely, if ever, developed in tridens. (6) A. psi has the black lines running through the fringes better developed. Here again the points of difference are all put forward with qualifying terms as to universal application, and must be taken for what they are worth.

In 1906 Dr. Chapman read a short paper at the City of London Entomological Society on this question (Trans. City Lond. Ent. Soc.) of which the following is a short summary. Although his own experience and breeding of the two species has enabled the Doctor to separate them with practical certainty, he expresses his "absolute inability to lay down any characters by which someone unfamiliar with these two

species" can do so. The following points are then dealt with.

1. Colour of the hindwing.—"In tridens the hindwings are without any dark scales, except in the actual hind margin, psi has dark shading along the veins in the spaces, and often has a dark central shade." "A good many tridens resemble psi very much in this matter." "A specimen of psi with pure hindwings is certainly very rare." "A male specimen with quite white hindwings is almost certainly tridens, with very slight dark scaling is probably tridens, with moderately dark scaling is probably psi, and with very dark scaling is certainly psi."

2. Form of the wing.—" Psi has altogether a broader wing." "The measures I have compared are the length of the wing (from centre of thorax to apex) with the breadth (from anal angle to costa). This is quite a definite difference and can be seen without measurement." But there is great difficulty in actual measurement as the results overlap.

3. Difference in marking.—"I have no hesitation in saying that the markings present no differences." Yet "some are unquestionably very constant throughout whole broods of one or the other species; but then they may equally be found to be similarly constant in the other species." "The separation of the marginal dots from the anal dagger in psi, and their junction, especially the upper one, with it, in tridens, is more constant than any other in the markings; still it has not infrequent exceptions."

4. Coloration.—" Psi is pure black and white; tridens has red, green, brown, and yellow. The pale form of psi, with white predominating, is probably always unmistakable. So in tridens, when richly suffused with pink, brown, or olive." "Tridens very commonly has the interior of the orbicular stigma coloured, or definitely of a different tint from the rest of the wing; psi, I think, almost always has it of the same colour as the rest of the wing." "Some dark specimens of psi have a series of pale patches down the hind margin. It is never so pronounced in tridens." "Still, all these matters of colour are, in fact, questions of degree rather than absolute difference."

Referring to his own and Mr. Tutt's remarks in Brit. Noct., quoted above, Dr. Chapman says, "Whilst they are equally valid now as when they were written, they are open to the same observation"-"that. whilst generally applicable, there are a good proportion of specimens of both species that present, not the markings here predicated of them,

but those of the other species."

At the same time Dr. Chapman read his notes he showed specimens obtained from various collections, viz.:—(1) Dr. Mason's. Several appeared to him wrongly determined and on examination were proved so in each case. (2) Mrs. Bazett's. The series of tridens. Seven out of eight appeared to him to be psi, and this opinion was verified on examination. (3) C. G. Barrett's. On examination of these it was found that two specimens of psi were placed with tridens—three specimens of tridens with psi.

In conversation with Dr. Chapman a few days ago he said that males with dark hindwings are always *psi*, while the males with white hindwings are sure to be *tridens*. Also that the *bidens* form of *psi* never occurs in *tridens*, nor does the pink form of *tridens* ever occur

in psi.

As a result to differentiate the imagines in words is practically impossible. The only reliable differences are biological and structural. Pierce, in 1909, Gen. Brit. Noct,, gives the clasper of tridens as trifurcate, while that of psi is bifurcate; and an examination of the figures on the plate leave no hesitation in one's mind as to the definite difference of the two, it is not a difference of degree. The best and only satisfactory way, of course, is to obtain the larve and breed the species, which are easily separable in that stage. With Dr. Chapman's paper as published in the Trans. City Lond. Ent. Soc. is a plate showing photographs of the clasps of the two species, where the differences are shown very well indeed.—H.J.T. [It is a curious coincidence that the name tridens might have referred to the clasps rather than to the wing-markings, three processes in tridens, two in psi. Even the pupa presents a similar coincidence.—T.A.C.]

POTES ON COLLECTING, Etc.

Phigalia pedaria (pilosaria) from Sherwood Forest.—I have just had sent to me by Mr. Daws, of Mansfield, some twenty examples of *Phigalia pedaria* (pilosaria) as a sample of the forms that have been taken in Sherwood Forest this spring. There are four main types of

ground and general colouration and three subsidiary ones.

1. Six specimens in which there is a greenish coloration, in one of which the green is slightly tinged with yellow in places. The costal clouds of these specimens are well marked, but the lines are not well defined on the five former examples. The one partially tinged with yellow is well marked, in some of the markings black prevails, in others brown. There is good contrast between ground and markings, so that

the specimen is a very pretty one.

2. Five specimens are of the soft grey general coloration, four of them being light in appearance and very much dusted with black, not brown. The costal clouds are well developed in all five specimens. The lines in the four are black, fairly well defined although diffuse. In the fifth specimen the forewing is devoid of most markings except the well marked costal clouds, and the grey is somewhat darker. The hindwings have the central transverse irregular band perfect and prominent, but the submarginal in the fifth is not nearly so perfect.

3. One specimen is of an olive grey with much brown powdering, the marking of a deep brown with well developed costal blotches. There is no ochreous colour. The brown powdering is very fine and

the lines clear cut, not fuzzy.

4. Five specimens in which the general colour is black or blackish grey. One is to be put down as ab. monotonia. It is thinly scaled, somewhat worn (possibly one of the causes of the semitransparency), ground of hindwings the same shade as that of the forewings. The veins are opaque black. There are no markings, not even traces of the usual costal blotches. The other four are dark blackish (not brownish) grey with darker veins. The costal clouds are marked, but most parts of the transverse lines are obsolescent, or very indistinct. In forewing coloration two specimens are of the same shade, the darkest, the third is somewhat lighter, and the fourth somewhat lighter still. The hind-wings of three of these are of the same shade of general coloration as the forewings, but one of the darkest forewinged specimens has lighter hindwings.

5. Five examples may be termed ochreous in general appearance. Three of these are decidedly ochreous, while two are grey with a slight tinge of ochreous. Of the three ochreous ones, one is somewhat lighter than the other two and has hindwings much lighter than the forewings, while the other two have the fore- and hindwings of the same coloration. The two grey with slight ochreous tinge differ inter se. The one has a very slight tinge only, with the two basal transverse lines distinct, while the two outer ones are obsolescent except on costa and inner margin; the other is darker and more uniform with only slight costal clouds, and all the transverse lines obsolescent, or very ill-defined in part. In the former the transverse central line of the hindwing is

well developed, while in the latter it is practically absent.

In my own cabinet series I had none of the greenish coloration, none of the soft grey and none of the blackish. The olive-grey I had from West Wickham, Brockley, Richmond, Chislehurst, etc. The light ochreous from West Wickham, Chislehurst, Chattenden, etc. In addition I have two rich ochreous specimens, one darker than the other, from Brockley and the New Forest respectively, two which are of a light, not olive, grey, with ill-defined lines in one and obsolescent lines in the other, from Richmond and Delamere Forest respectively, and a fine specimen of the Huddersfield race of a deep rich uniform brownblack, with hindwings only very slightly thinner in coloration, having no markings, but with darker veins and no trace of the costal clouds. It seems to be more thickly scaled than many specimens are.

I have, as will have been noticed, only dealt with the males. This series is a very good instance, showing how interesting sets of examples of a common species, from various parts of the country, may turn out, when brought together and compared. That the above does not exhaust the potentiality of the variation in this species will no doubt be noted by reference to the reader's local series, and by a perusal of Barrett's

summary, Lep. Brit. Isles.—H.J.T.

CURRENT NOTES AND SHORT NOTICES.

The Rev. C. R. N. Burrows and myself have collected a Register of all the Localities of which accounts of the Lepidoptera have been

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given by various collectors in the whole of the volumes of the Entomomologist's Record, the Entomologist, the Entomologists Monthly Magazine, the Proceedings of the South London Entomological Society and the Transactions of the City of London Entomological Society. The references are to the Volume, Page, Collector, and generally Month and Year. If any subscriber to our Magazine wishes to know the possibilities of a locality, which he intends to visit, we shall be pleased to give the references in the number subsequent to receiving a postcard from him, assuming of course that the request be made before we go to press. No reply will be sent otherwise than in the pages of the magazine.

In the Irish Naturalist for December we read "Colias edusa was not uncommon near Tranmore, Co. Wexford, from the beginning of September." A var. helice was taken on September 29th. A larva of

Manduca atropos was reported from Moyallen, Co. Down.

We should be very pleased to receive personal notes of the doings and whereabouts of entomologists, who are taking duties either directly or indirectly in "active service," for insertion in this column. We have had communications from Capt. Malcolm Burr, Capt. P. P. Graves, and H. W. Andrews, all in the Eastern area, more or less recently.

In the Scottish Naturalist for February reference is made to more captures of Agrius (Sphinx) convolvuli, one in Bute and another at Stronvar, Perthshire. Phibalapteryx lapidata has also turned up in a new locality, viz., Blawhorn Moor, Linlithgow, in the Lothian Hills.

In the Naturalist for February Mr. F. H. Day gives a summary of his work during 1917 among the Coleoptera of Cumberland. His best capture was Hydroporus rujifrons, and H. discretus was recorded as new to the district.

In the Ent. Mo. Mag. for February Mr. H. Britten describes a new species of the genus Choleva (Col.), Choleva glauca, which he differentiates from C. cisteloides, to which it is closely allied.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

January 10th, 1918.—Deaths.—The decease of two members was announced. Mr. W. West (Sutton), a member of the Council, aged 71,

and Mr. W. Manger (New Cross), aged 75.

Indian Butterflies.—Mr. Édwards exhibited three species of the N. Indian genus Dodona, viz., D. adonira, D. durga, D. ouida of the Nemeobiinae. He also showed Riodina lysippus, Mesene phareus, Apodemia glaphyra, and Echenais penthea belonging to the Lemoniinae from S. America.

Variation in A. coridon.—Mr. B. Adkin, series of Agriades coridon ab. semi-syngrapha and ab. syngrapha, with a graduated series of intermediates, and read notes on the exhibit. A short discussion took place on the naming of aberrations.

THE GENUS THAIS.—Mr. Turner series of the three species of the genus Thais, T. rumina, T. polyvena, and T. cerisyi, and read notes on

their variation and distribution.

ABERRATION OF A. URTICÆ.—Mr. Bowman, a bred example of Aglais urticae with curious leaden patches.

REPORTS OF FIELD MEETINGS AND VISITS.—The Reports of the Field

Meetings and Visits were communicated to the Society by Messrs. Bowman and Turner.

January 24th.—Annual Meeting.—The Balance Sheet and Report of the Council were received and adopted. The following members were elected as Officers and Council for 1918-19.—President, S. Edwards, F.L.S. Vice-Presidents, R. Adkin, F.E.S., and H. J. Turner, F.E.S. Treasurer, T. W. Hall, F.E.S. Librarian, A. W. Dods. Curator, W. West. Editor of Proceedings, H. J. Turner, F.E.S. Secretaries, S. Edwards, F.L.S., and Hy. J. Turner, F.E.S. Council, W. J. Ashdown, K. G. Blair, B.Sc., R. T. Bowman, A. W. Dennis, F. W. Frohawk, F.E.S., M.B.O.U., Lachlan Gibb, F.E.S., C. W. Sperring, A. E. Tonge, F.E.S., and B. W. Adkin, F.E.S.

The President, Mr. Hy. J. Turner, read the Annual Address.

Mr. Edwards took the chair. Votes of thanks were passed to the

retiring President, Officers, and Council.

ORDINARY MEETING.—ABERRATION OF P. BRASSICÆ.—Mr. Dennis exhibited enlarged photographs of Mr. Adkin's P. brassicæ, with white bars on the apical black patch, to show there was no absence of scaling.

C. SORANA.—Mr. Turner, series of the beautiful Catagramma sorana

from Paraguay.

THE GENUS AENEA.—Mr. Edwards, species of the genus Aenea from S. America, and spoke of their affinities and neuration.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

December 17th, 1917.—Annual Meeting.—The following were elected officers and council of the Society for the ensuing year; viz:—President.—Wm. Webster, A.R.S.A. Vice-Presidents.—L. West, R. Wilding, and R. S. Bagnall, F.L.S., F.E.S. Hon. Treasurer.—Dr. J. Cotton. Hon. Librarian.—F. N. Pierce, F.E.S. Hon. Secretary.—Wm. Mansbridge, F.E.S. Council.—Messrs. C. F. Burne, A. W. Hughes, H. F. Carter, F.E.S., Wm. Buckley, J. W. Griffin, J. Collins, Dr. P. F. Tinne, Prof. R. Newstead, F.R.S., and S. P. Doudney.

Annual Address.—The President delivered an address entitled "Some Aquatic Insects," which was illustrated by a collection of 130 lantern slides representing the life-histories of many species of insects which live in or about the water. In his introduction Mr. West touched upon the general conditions of aquatic environment, such as the effect of the geological formation upon the character of the water and the flora maintained by it, and consequently, the species of insects found in a particular district. The saline and acid or alkaline quality of water was discussed and the reaction upon insect and vegetable life resulting from a particular condition, was illustrated by various examples. The photographs, nearly all taken by the President himself, were very fine examples of such work done under conditions of exceptional diffi-The series included life-histories of the following species:— Chironomus, Culex, various Ephemeridae, Trichoptera and Perlidae, aquatic Coleoptera, as Dytiscus and the "whirligig" beetles, the whole presenting a very clear and connected idea of the lives of these interesting creatures in their natural element.

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REVIEWS AND NOTICES OF BOOKS.

REPORT OF THE PROCEEDINGS OF THE SECOND ENTOMOLOGICAL MEETING, held at Pusa, 1917. Edited by T. Bainbrigge Fletcher, R.N., F.L.S., F.E.S., F.Z.S., Calcutta, 1917.—From the Imperial Entomologist of India, T. Bainbrigge Fletcher, R.N., F.L.S., we have received a copy of the above Report of the meeting held at Pusa, February 5th to February 12th, 1917, recently published. It consists of a quarto volume of more than 300 pages with 34 coloured plates, and is practically a very full abstract of the current knowledge of Indian crop-pests. It is hoped that it may be of "assistance to non-entomological members of the Agricultural Departments and to others interested in the minimising of damage to crops by insects." References are constantly given to "Some South Indian Insects," a book by the same author reviewed in this magazine some years ago. The coloured plates are illustrative of a series of life-histories which have been printed and issued from Pusa at various opportunities during the past few years, and are admirably executed by Indian artists on the Staff. In an opening address the chairman, Mr. Fletcher, explained the objects of the Meeting and the methods of procedure, incidently touched on a few biological problems of general interest, and emphasised the necessity of the exactitude of records. The various crops were dealt with in groups. Hill Crops including Tea, Coffee, Rubber, etc. Leguminous Field Crops including Beans, Peas, Grain, Lentils, Hemp, Indigo, etc. Oil-seeds: Castor, Linseed, Sunflower, etc. Malvacere: Cotton, etc. Fibre Plants: Jute, etc. Cereals and Fodder Plants: Sugar-cane, Rice, Wheat, Oats, Grasses, Bamboos, Lucerne, etc. Fruit-trees: Orange, Mango, Guava, Grape, Peach, Fig, Mulberry, Cashew, Tamarind, etc. Palms: Coconut, etc. Garden Plants. Drugs and Dyes: Tobacco, Opium, etc. Cruciferous Crops: Cabbage, Turnip, Beet, etc. Vegetables and Condiments: Potato, Chillies, Ginger, Yam. Celery, Pepper, Gourd, etc. All the known enemies of each crop are considered in detail and means of control are discussed, each representative in turn giving the results of his observation and experience in that spirit of "mutual confidence and mutual aid" which the chairman in his address urged should be their motto. The life histories of Etiella zinckenella, Agrotis ypsilon, Heliothis armigera, Utetheisa pulchella. Terias hecabe, Ypsolophus ochrophanes, Cirphis loreyi, Herse convolvuli, and Glyphodes indica are among the Lepidopterous subjects dealt with on the plates. Mr. Fletcher has taken the opportunity to illustrate one of the "plumes," Sphenarches caffer, a member of the group which he studied in considerable detail a decade or more ago. In all the plates the figures of the earlier stages and of the methods of attack are faithfully depicted and must be of great use to agriculturists more or less unfamiliar, as most of them are, with the less noticeable portions of the life-histories of these pests. On a good proportion of the plates, illustrations of the parasites, which tend to control the increase of the species, are included.

The larva of two species of Earias, E. insulana and E. fabia, whose life-histories were admirably pourtrayed in "South Indian Insects," cause an immense amount of damage to the "bolls" of growing cotton. The following extracts from the discussion on the attempts at control are very interesting. "The control of the bollworm can be attained by introduction of the parasite" [Rhogus, sp.? (Hymen.)] "We have sent living parasites from Pusa to the Punjab

during the last two years with this object in view." "We (in the Punjab) receive the parasites from Pusa in June and July and liberate them in the parasite breeding plots, and in this way we get them established by the time the cotton is in the 'boll.' When the parasites get well established in the parasite-breeding-plots we remove the affected bolls and place them in parasite-boxes which are sent out and placed in badly affected cotton fields." "By the second week in August we get the parasites established and from that time onwards we begin to distribute them until about November." These parasite-boxes were "placed in boll-worm affected cotton-fields and left for a fortnight; at the end of that time, affected cotton-bolls in the adjacent area were collected and placed in other parasite boxes and distributed further." "These were used over and over again because all the parasites leave them within fifteen days. When the parasites were established the boxes were refilled with bollworm-affected bolls and distributed again." conclusion we have arrived at is that by the use of the parasite boxes the attack of bollworm is generally lessened. Where the parasite-boxes are not used the attack is always bad." Mr. Fletcher sums the whole evidence, "I think that a great deal more investigation is required before we can say much definite about the real value of these parasites. Our experience at Pusa, in breeding these parasites under the most favourable conditions in special plots which are kept full of Earias, is that the percentage of parasitization is extremely low. The conditions of course may be different in the Punjab, but we want to know a great deal more about the matter."

"Rice is far and away the most important crop grown in the Indian Empire" and nearly thirty pages are devoted to the consideration of the various pests. Attacking the seedlings we get the Hadenid moth Spodoptera mauritia, Thrips oryzae, a crab (Paratelphusa hydrodromus), Attacking the leaves there is a long list of Lepidoptera of which Cirphis unipuncta ("Army Worm."), C. loreyi, and Nymphula depunctalis are the worst enemies, but the damage done by the many other species of Noctuidae, etc., dealt with, which are general grass feeders, must in the aggregate be very large. Two species of grasshopper attack the leaves as well as nearly a dozen species of Coleoptera. Insects which bore the stems of rice come next, two of which are of great importance. Cecidomyia oryzae (Dip.), coloured Plate, and the moth Schoenobius bipunctifer, ("Some S. Ind. Ins.," plt. xxix.), the latter a pest spread over the whole of South-Eastern Asia and estimated to cause damage to the amount of 100,000,000 rupees annually in Southern India alone, are fully discussed. The roots of paddy are apparently attacked by but few insect pests. Among Rhyncophora or sucking insects most are minor pests, occasionally, and then only locally, doing damage to any extent. Of these Leptocorisa varicornis and Nephotettix bipunctatus,

have hitherto been the most troublesome enemies.

From the above extracts it will be seen that this is a most useful publication, which registers the actual work and observations carried on by the workers themselves under the guidance of a skilled and experienced organiser. We must congratulate Mr. Fletcher on the work he has furthered so well, and wish him all success in his endeavours to keep in touch with so wide-spread a band of skilled practical entomologists, and at the same time so to organise these biennial congresses that each worker may in turn impart his detailed skill to others.—H.J.T.

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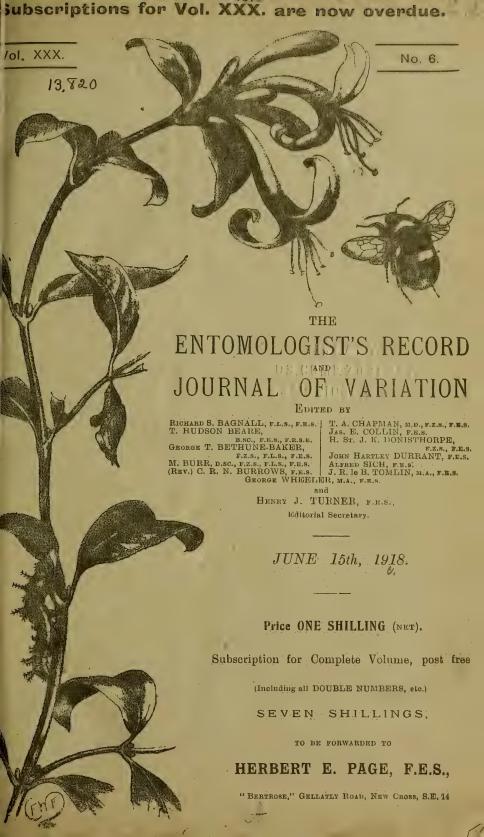
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warieties."—J. W. Tutt, F.E.S., "Notes on the pupe of Castina and Althoonaris."—T. A. Chapman, M.D.; F.E.S., "It is a superior of short notes are contained in every number under the following titlas: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Lifehistories," "Notes on Collecting," "Current Notes," The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month

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Mosquitoes and Malaria.

Readers will no doubt call to mind that in the "Current Notes," pp. 188-9, vol. xxix. (1917), there was printed the substance of a memorandum received from the Local Government Board as to information desired regarding the prevalence of Anophelines. As considerable apprehension is felt that malaria may be introduced in various parts of the country by returning soldiers, this memorandum has been ressued with much additional matter as to the identification of specimens.

The South-Eastern Union of Scientific Societies has constituted a standing Committee, with the Rev. T. W. Oswald Hicks as Hon. Secretary, to further this investigation through the Societies affiliated

to the Union.

We print below the additional information as to the Identification of Specimens, which may be of use to those who have a considerable knowledge of entomology. But in all cases it would seem best to forward the specimens to a specialist for full identification or verification. This is neither a difficult nor laborious task, for the gnat suspected can be placed in an envelope such as collectors use to send butterflies from abroad, and forwarded enclosed with a letter giving the details asked for to the Rev. T. W. Oswald Hicks, "Lesware," Linden Road, London, N. 15, or direct to Mr. A. J. Grove. c/o Medical Officer, Local Government Board, S.W. 1.

- "Anopheline mosquitoes may be distinguished from Culicines by the following characters:—
 - "(a) The attitude.—An Anopheline mosquito resting on a wall holds itself so that its body (which forms almost a straight line with the head and proboscis) projects so as to form a distinct angle with the substratum. In the case of the Culicine mosquito, the body (which is hump-backed in appearance) is held parallel to the supporting surface.
 - "(b) The length of the palpi in the female.—The palpi of male mosquitoes, both Anopheline and Culicine, are long, and furnished with long hairs, which together with the plumose antennæ, give the head of the male mosquito a feathery appearance. The palpi in the female Anopheline are simple slender rod-like structures, and are as long as the proboscis, whilst in the female Culicine they are short, insignificant appendages.
- "There are three species of Anophelines found in the British Isles, viz., A. maculipennis, A. bifurcatus, and A. plumbeus (nigripes).
- "A. maculipennis may be distinguished from other British Anophelines by the fact that the legs and palpi are unbanded, and that the wings have four spots in the body or field of the wing, but no spots on the costal margin.
 - "A. bifurcatus resembles A. maculipennis, but differs from it in that June 15th, 1918.

the wings are without spots, that it has two broad bare lines in the front of the thorax, and golden coloured hairs on the abdomen.

- "A. plumbeus (nigripes) is smaller than A. bifurcatus, the wings are unspotted but darker in colour. The thorax has grey markings on it and the palpi are banded.
- "The adults of all three species are active during the warmer months of the year, from May to October, during which time both males and females are present, but the females of A. maculipennis hibernate, and are found in suitable hiding places, such as cowsheds, stables, cellars, etc., throughout the winter.
- "The larvæ of Anophelines may be distinguished from Culicines by the fact that when they come up to the surface of the water to breathe they lie parallel to the surface film, whereas the Culicine larvæ hang head downwards, supported in the surface film by the tip of a prolongation of the hinder end of the body.
- "It is not so easy to distinguish between the pupæ of Anopheline and Culicine mosquitoes as between the larvæ and adults, and it is preferable to keep the pupæ and allow the perfect insects to emerge and then determine their identity.
- "Arrangements, in which the British Museum (Natural History) are co-operating, have been made for identification in cases of doubt."

Quoting from "Mosquitoes and their Relation to Disease," issued by the British Museum (Nat. Hist.), we read, "The *Anopheles* mosquito can be distinguished from the others by several characteristics:—

"1. The position of rest: the whole body extends in a straight line at an angle with the surface on which the mosquito is resting; in other mosquitoes the body-line is bent, owing to the more rounded or humped shape of the thorax.

"2. In the great majority of the Anopheles the wings are spotted,

whereas in the great majority of the others they are not.

"3. In the female Anopheles the palpi are as long as the proboscis, while in most of the other genera they are much shorter.

"4. When viewed under a microscope most mosquitoes are seen to have the abdomen covered with scales like those on a butterfly's wings,

but in nearly all Anopheles these scales are absent.

"5. The larvæ of Anopheles when at rest lie parallel with and touching the surface of the water, being held to the surface-film by a number of remarkable rosette-shaped tufts; the breathing organ is small. Other mosquitoes have larvæ which hang head downwards in the water when at rest, and have no rosettes, but on the other hand have the breathing organ developed in a tube."

Attention should not be too exclusively directed to the larger and more obvious ponds or streams; the grass-grown ditches, swamps, and shallow impermanent breeding places are generally free from many of the mosquitoes' enemies, which can only live and breed in the deeper pools and permanent collections of water. It is vital, therefore, that

these inconspicuous breeding haunts be carefully searched and examined.

It is important to remember also that the absence of Anopheles larve on cold, sunless days is not sufficient evidence that the water is untenanted. Experience has proved that they may only be in concealment, and will often reveal their presence on warmer or more sunny days.

Figures will be given next month to illustrate these notes.

—H.J.T.

Tutt's British Lepidoptera, Vol. I. By W. PARKINSON CURTIS, F.E.S.

Being kept in bed and not allowed to do anything for a day or two, as a result of influenza and too much work, I have been amusing myself by reading Tutt's British Lepidoptera, a book presented to me with Stainton's Tineina, when I got married. It is a very interesting book, and is crammed full of the things that one wants to know. But two things have aroused my curiosity, and I wonder whether, without giving yourself a lot of trouble, you could enlighten me. Cambridge is given as authority for "Wareham" as a locality time after time. Now I don't believe Wareham means Wareham any more than Blandford (Cambridge) in an earlier era meant Blandford. Bloxworth, where the Rev. O. P. Cambridge lived, was once in the Blandford postal area. Bloxworth to-day is in the Wareham postal district, but faunistically Bloxworth is at the parting of the ways. Wareham is a Tertiary and later district. Blandford is a Cretaceous district. Bloxworth stands at the junction. To the south is the typical moorland of Dorset so very pronounced around Wareham. Northward is the heavy loam and chalk downs of the Dorset development of the upper chalk. Bloxworth itself having very close to it the junction beds of the Reading, Woolwich and London Clay series.

My brother and I know, in the dark, out there, when we are off, or on, the London Clay, in late June and early July, because Noctua ditrapezium never comes off the London Clay into the parts of the local woods with other geological formations. We know according to where we sugar if we are going to pick up N. ditrapezium or not, and it never seems to trespass on to, say Bagshot sand, even if it only be a few yards. It is very wonderful really that, as it is a local rarity in Dorset, not a

common insect as it is in the London district.

We all know that *Eulepia cribraria* (form *bivittata*) is still taken south of Bloxworth, and got recorded by Frederick Bond for Blandford, where it never did occur and probably never will, because Bloxworth was included for postal purposes in Blandford. It occurs to me that "Wareham" may sometimes fall into the same category as an imagi-

nary locality invented by H.M. Post Office.

Particularly was my attention called to this by vol. i., p. 154, where stress is laid on the liking of M. thunbergella for the chalk, as of course the Fens are Gault, and so many of the localities given have pure carbonate of lime as a very material part of the soil. In fact of the localities given, that I know of, Brockenhurst is the only one not definitely in a carbonate of lime soil, but then there are (notably on Ramnor) many places where beds bearing much lime come to the surface in the New

Forest, and in many places the Bracklesham Beds are highly charged with lime.

The New Forest is really known very superficially indeed. Millions of insects are caught there, especially by dealers. If labelled at all, it is "New Forest." Almost as well label them "England." It is too big, too varied, and too many localities rolled into one, to be treated as if it were what it is not, a homogeneous whole, and as there is hardly a decent cutting in it, and very few borings, I don't lay much store on the geological survey of it; that is decidedly on the skin deep side. It really wants careful study over a long period. Of course I may be absolutely wrong in associating strata with the distribution of insects, but it is more or less an untried key to distribution, and to some extent

I have found it does account for absence or presence.

On p. 155, is given Dorset, Kimpton (Curtis). Where is Kimpton in Dorset? I don't know. If the "Curtis" is not the famous father of British Entomology, the betting is in favour of its being me, though I was not vastly interested in tiny things in 1898, but for at least three years prior to that date I had been catching small stuff for Mr. Eustace Bankes pretty regularly, sending it to him with very closely localised data. Is it now possible to tell whence Mr. Tutt got that particular locality? The name is not to a Dorset ear Dorset language, it sounds like Sussex to my ear. There is a village called "Drimpton" on the Dorset-Somerset border, that is on the Upper Oolite, I think. "Imp" is not a Dorset combination, it is a Sussex one. I cannot think, if the name be right, why I have not heard of it. If I am supposed to be the "Curtis" in question, I never have been to Drimpton. If it was my great namesake, I did not know he collected in Dorset. We have Knighton, Kniton, Kinson, Kingston, Compton, etc., lots of them mainly on chalk or limestone, but no "imps." I only found Drimpton after a careful study of the Ordnance Survey map, and that section in colours for the geology is £2 12s. 6d., and so I have not got it, but guess my strata from contouring off from Pilsdon. Of course Dorset possesses no end of "duns," "dons," "tons," etc., as one would expect in a primeval "Flanders" front, likewise no end of "Knights," "Kings," and "Regis," "Abbas" and "Abbots" of a later mediæval time.

Don't go into a research to try to answer this, but the point may be worth clearing up, as I am very careful about data and usually print my locality labels, I never write them; but Mr. Bankes might have taken it from a letter, misread the word, and passed it on without realising that he had been trapped, especially as, for so critical a man, he rarely questioned my localisations. When he did so I could always draw him a map, which enabled him to go straight to the place, and nearly always resulted in getting the insect for himself by way of confirma-

tion.

On page 399, under Adscita statices, the locality "Hodd Hill, nr. Shillingstone (Fowler)," I do question seriously. Do you know anyone who saw a statices taken by Fowler on Hodd Hill? (which has two "dd's"), because I failed to find it there, and so did E. R. Bankes, and so did the two of us together, when we made a special effort to settle it. I always told Fowler his Hodd Hill statices were geryon, and he never believed me, although I have taken geryon in Sussex, and have them from Malvern, and I have a few globulariae from Sussex, and a tremendous series of statices from the limestone hills in the Weser

district of Germany so I do know the insect. I have a long series of geryon from Hodd Hill, and E. R. Bankes took a good series in my company, but he was as satisfied as I was that what we got were geryon, and we worked the entire hill very carefully. Adscita geryon is the only Dorset "forester" approaching even regular occurrence according to my own experience. [Possibly some of our readers may be able to comment on the above.—H.J.T.]

OTES ON COLLECTING, Etc.

Elater sanguinolentus Schr., retaken on Wimbledon Common.—On May 28th, when hunting for bees for my friend the Rev. F. D. Morice, on Wimbledon Common, I observed a red "Elater" crawling up a grass stem, and on picking it up I was surprised to find it was Elater sanguinolentus. A few more were netted as I strolled about looking for Hymenoptera, and others were seen flying over the birch trees, etc. On June 1st a friend who was anxious to obtain this beetle accompanied me to the same spot, and a nice series was taken on young birch, oak, and sallow; others being captured on the wing. As far as I am aware this species has not been taken on Wimbledon Common for some 25 years, when the last specimen was captured by Prof. Hudson Beare. I have always regarded it as one of those beetles (in company with such as Stenus kiesenwetteri, Anchomenus sexpunctatus, etc.) which have disappeared from Wimbledon, probably on account of the large numbers of people who frequent the common on high-days and holidays, etc.

Rye [British Beetles, 133 (1866)] writes—" Elater sanguinolentus occurs at the roots of heath on Wimbledon Common, where it has also

been taken copiously on the blossom of the nettle."

I personally did not want the insect, as I have taken it (in common with many other Coleopterists) in the New Forest, where it is usually found by beating young Scots Firs. It has been recorded from the following other British localities:—Darenth Wood, Richmond Park, Epping Forest, Salisbury, Christchurch, Oxford, Bewdley Forest, Woking, Newbury, and Wellington College.—Horace Donisthorpe.

Notes on Entomological Collections in the Mountains of Sicily.—On April 10th of the current year my wife and my daughter Erilda left Florence to go to Sicily to collect Lepidoptera. They arrived at Palermo on the 15th of the same month, but had to spend several days to find a convenient locality in which to make collections. On April 20th they took up their abode in San Martino delle Scale, a little village of about 200 inhabitants, near Monreale, at about 2,000 feet above the sea, and at once began collecting along the slopes of the neighbouring Monte Cuccio (3,000 feet). The vernal broods of Pieris rapae, Pontia daplidice, Gonepteryx eleopatra, Pararge megera, Callophrys rubi, and Rumicia phlaeas were already in full decline, and only a few defective specimens were collected. Even the specimens, all males, of Colias edusa (croceus) were a good deal damaged. The form does not correspond at all to the vernal form of Tuscany, named vernalis by Dr. Verity, but in size and colour appear to be that of our second brood. Of Polyommatus icarus, of the Italian vernal form, there were as many

worn individuals as there were of fresh ones. The Anthocharis crameri (belia) and Euchloë cardamines were in full development, but it was not possible to collect many specimens on account of the inclemency of the season. The Aricia medon emerged in a form which differs from that of the continent by the presence of a complete series of fulvous lunules well marked even in the males. The vernal brood of Coenonympha pamphilus and Cupido minimus were nearly over, still it was possible to collect several good specimens. Both species appeared in races such as I had never met with in other parts of Italy. The C. minimus is especially notable for its extreme smallness; the largest specimen measures only 18mm. across the wings, from point to point, whilst the smallest specimen from other localities which I have seen measures at least 21mm. Both males and females are entirely black on the upperside. Of Pyrameis cardui and P. atalanta there flew as many tattered specimens, all females, as there were fresh ones (males and females). On May 3rd, 1918, Melitaea cinxia began to emerge in a race which seems to me identical with that of Tuscany. The same day there appeared also Amata (Syntomis) marjana, a superb new species recently discovered by Stauder, and Zygaena oxytropis. There were also captured or seen to fly out of reach of the nets, perfect males of Papilio podalirius and P. machaon. On May 5th a male of Aporia crataegi race augusta and one of Melanargia pherusa were captured. From May 7th to the 11th it was impossible to collect on account of the rain. I will communicate the results of the further collections as soon as I receive the material and observations from my daughter.— ORAZIO QUERCI, Florence. May 16th, 1918.

RARE BRITISH BUTTERFLY.—"Mr. L. G. Esson, the well-known Aberdeen naturalist, who is at present on an entomological excursion to Kinloch Rannoch, Perthshire, has had the good fortune to secure a specimen of the rare butterfly, Vanessa antiopa, the Camberwell Beauty of the white-banded form. This is one of the rarest British butterflies. The specimen secured measures four inches across the wings." (From an Aberdeen paper.)—C. Nicholson. April 20th, 1918.

REFERENCES FOR COLLECTING AT BOURNEMOUTH.—Ent. Record, Vol. II., p. 235, August, 1891; Vol. III., p. 209, July-August, 1892; Vol. XI., p. 301, 1899; Vol. XII., p. 340, July-August, 1900; Ent. Mo. Mag., Vol. II., p. 21, July, 1864; Vol. XXXI., p. 142, August, 1892; Proceed. S. Lond. Ent. Soc. (1899), p. 96, July, 1899; Entomologist, Vol. XVI., p. 201, 1883; Vol. XXXI., p. 57, March, 1897; Vol. XXVIII., p. 340, 1895.

REFERENCES FOR COLLECTING AT BARMOUTH, NORTH WALES.—Ent. Mo. Mag., Vol. II., p. 21, July, 1864; Vol. IV., p. 210, August, 1867; Entomologist, Vol. XXX., p. 248, July, 1896; Vol. XXVIII., p. 161, July, 1894; Vol. XXXVIII., p. 290, July, 1904.

References' for Collecting in North Wales.—Ent. Record, Vol. II., p. 63, March, 1891; Vol. XII., p. 269, June, 1900; Vol. XIII., p. 369, September, 1901; Vol. XVII., p. 259, July, 1904; Ent. Mo. Mag., Vol. X., p. 179, Summer, 1873; Vol. XIII., p. 211, October (sugar), 1876; Entomologist, Vol. VI., p. 405, March, 1873; Vol. X.,

p. 256, July, 1877; Vol. XXII., p. 294, 1889; Vol. XXV., p. 315,
July, 1892; Vol. XXVI., p. 196, Spring, 1893; Vol. XXIX., p. 289,
May-June, 1896; Vol. XXX., p. 67, August, 1896; Vol. XXXI.,
p. 20, 1897; Vol. XXXII., p. 95, 1898; Vol. XLI., pp. 64, 91, 1907.

Sizes of British Butterflies.—I was interested in reading the measurements of British Lepidoptera in the Record some time ago, and thought that a few more might perhaps be of interest to other readers. The specimens measured are in my own collection and mostly captured. The measurements are given in millimeters.

P. machaon, small 3 60; large 2 94.

P. brassicae, small 3 42, \$ 44; large 3 69, \$ 73.

P. rapae, small 3 34, \$\, 35; \text{ large 3 59, \$\, 55.} P. napi, \text{ small 3 38, \$\, 35; \text{ large 3 52, \$\, 54.}

E. cardamines, small 3 34, \circ 35; large 3 48, \circ 50.

A. urticae, small 3 35, 9 35; large 3 58, 9 58.

V. io, small ♂ 42, ♀ 45; large ♂ 70, ♀ 68. P. cardui, small ♂ 45, ♀ 47; large, ♂ 74, ♀ 72.

B. quercus, small 2 25; large 3 40.

P. icarus, small & 24, \(\rightarrow 21 \); large & 36, \(\rightarrow 38 \).
P. atalanta, small \(\sigma 50 \), \(\rightarrow 52 \); large \(\sigma 72 \), \(\rightarrow 74 \).

L. sibilla, small 3 49; large 2 64.

I also have four or five Abraxas grossulariata that were taken at large that only measure 26mm. There were plenty of the normal sized specimens flying at the same time, but all the foliage was completely stripped from the currant trees on which the larvæ had fed, so I think that these small specimens were probably some of those starved for want of sufficient food.—WM. DAWS, Mansfield, Notts. April 12th.

A FEW Notes from Mansfield, Notes.—My first visit in search of Lepidoptera this year was on February 1st, when I went to my favourite woods, or rather what is left of them, for the greater portion has been cut down for war purposes and the ground cleared of all the undergrowth, which has been burnt ready to reafforest with young trees. My journey was a blank, I did not capture a single insect. On February 20th I paid another visit, and this was almost a blank. I pulled off a great quantity of bark from old fallen trees in search of pupæ. At times I have found plenty of Jocheaera (Acronicta) alni by this method, but this time I had no luck, the only insect I found under bark was an Ichneumon.

On March 27th I again went over the same locality and took a few Phigalia pedaria and Alsophila aescularia, a pupa of Dasychira pudibunda spun up between old oak leaves at the base of an oak tree, and a cocoon with an empty pupa-case of Orgyia antiqua, the cocoon covered by a mass of ova. On this date I also took a male Tephrosia crepuscularia (biundularia), the earliest date on which I have ever taken this species. To fill up my time I collected a quantity of oak-galls, the round ones like marbles, both recent and old ones with holes in them. From them I have had emerge a female Diurnea fagella, the larva of which, for the purpose of pupation, no doubt had entered the gall by the hole made by the original tenant, and also an Ichneumon.

On March 29th the same round was taken. This time P. pedaria and A. aescularia were out in plenty, but there was not much variety.

I took one hybernated specimen of *Cerastis vaccinii* at rest on a post in the wood.—Wm. Daws, Mansfield, Notts. *April* 12th.

Visits to Sherwood Forest in 1918.—My son, W. J. Daws, made his first visit to that portion of Sherwood Forest known as Bricklands this year, on February 3rd, in search of Lepidoptera. He keeps no collection of his own, but is a zealous collector and has been the means of adding some good things to my collection in the past. He was the first to record the capture of Plusia moneta in Nottinghamshire. On this date, February 3rd, Plugalia pedaria was fresh out, and he selected a few of the best marked forms and took a fine dark olive form. Cheimatobia brumata was still out in numbers, and a few were secured in good condition. Hibernia leucophaearia was in numbers, both the type and the variety marmorinaria, which latter varied much in the colour of the bands. Hibernia rupicapraria was well out at this date, and both Diurnea fagella and Tortricodes hyemana (tortricella) put in an appearance.

His next visit was on February 17th, when *Phigalia pedaria* was out in numbers, and among those picked out were three of the olive form. *H. leucophaearia* was now in scores, and *Alsophila aescularia* in profusion. There were hundreds of *D. fagella*, from the typical form to the melanic form known as *dormoyella*. He also took a fine male example of *Hibernia defoliaria* on this date, a very heavily banded specimen with a distinct narrow band on the lower wings. It is the finest

example I have in my series.

On February 24th, his next visit, he found all the species previously mentioned in the utmost profusion, except of course *H. detoliaria*. Four of the very nice olive form of *P. pedaria* and one black female were brought me.

P. pedaria and A. aescularia were still out in great number on March 3rd, and on March 10th several more of the olive form of P.

pedaria were obtained on both visits.

March 17th again found him in the Forest and two more of the olive form were obtained. A. aescularia was still in profusion. There was some variety in the colour of the various specimens brought me, some had a slight reddish shade while others were darker and duller.

Another visit on March 31st found *P. pedaria* still "going strong" in spite of enemy raids on their stronghold, and three more of the clive form were captured and one typical female. On this date my grandson accompanied his father to the Forest, and in his youthful attempt to box a specimen of *A. aescularia* it fell to the ground amongst dead bracken, in the search for it he found a melanic *Taeniocampa instabilis*,

the darkest I have in my series.

On April 1st he was again in the Forest and P. pedaria and H. leucophaearia were noted in good numbers, but only one olive form was met with on this occasion. Hibernia marginaria (progemmaria) was now well out, both type form and the var. fuscata. He tock three females which differed considerably in the markings on their stunted wings. One has kindly deposited a good batch of ova. He also took on this date one female of Pachys (Amphidasis) strataria (prodromaria) and four specimens of Tephrosia crepuscularia (biundularia), one of the light coloured form and three of the dark var. delamerensis form. One of these shows signs of a cross between the two forms, it has what I

may call a "mingled" appearance. He also took two specimens of Taeniocampa munda, both light forms, one being an example of the ab.

His last visit to the Forest, up to the time of writing, was on April 7th, with *P. pedaria* and *A. aescularia* still to be found in quantity, but again only one of the olive form of the former was met with. Six more *T. crepuscularia* (biundularia) were obtained, four males and two females, all of the dark delamerensis form. I have mostly taken them from the first week to well on in June.—W. Daws, Mansfield, Notts. April 12th.

Some Records of Leucania vitellina in West Cornwall.—At the end of 1889 a friend sent me as a present a rather worn example of Leucania vitellina taken in S. Devon. He would not then give me name and exact place of capture, but promised to do so later. However, he shortly afterwards passed over to the great majority without doing so. Previously, in the same year, I had been staying near Penzance and at sugar had secured an example of this species. Subsequently I have taken others and now furnish the dates of capture. All were taken at sugar in the same locality. 1889, Sept. 20th; 1890, Sept. 26th and Sept. 30th; 1891, Sept. 20th; 1893, Oct. 1st; 1894, Sept. 28th. Six specimens in all. I believe Sept. 20th, 1889, is the earliest date for the appearance of this species in Britain.—W. Daws, Mansfield, Notts.

A Few Notes on the Season of 1917, mainly in and near Mansfield, Notes.—I made my first entomological ramble in the middle of February. Only a few Cheimatophila hyemana (tortricella) were to be seen and no Hibernia leucophaearia. In the beginning of March I went over the same ground again. This time Phiyalia pedaria (pilosaria) was now out but scarce; I took one of the olive variety. Again I did not see a single H. leucophaearia, in fact, in my favourite locality for this species I did not meet with even one specimen in the season of 1917. Alsophila aescularia, Hibernia rupicapraria and H. marginaria (progenmaria) were all in fair numbers at this date, while C. hyemana (tortricella) and Diurnea fagella were both very abundant. I did not find any females of the above-mentioned species. Cheimatobia brumata and C. boreata were to be taken up to well on in March, in fact, these two species must cover a flight period of about six months.

On May 30th two "whites" in cop. rose from the garden path. I netted them and at once put them in the bottle. On turning them out I was surprised to find a male *Pieris rapae* and a female *P. brassicae*, and felt very vexed with myself for killing them without closer examination. As it was I set them and put them in my collection.

About the 4th of April I took two Polyploca flavicornis on the trunks of birch trees. About this time I bred a rather small yellow variety of Pieris napi, one of a number that lay over from the summer brood

of 1916. It was from Donegal parents.

During the summer months I only took ordinary common species. From the middle of June to the first week in July Eupithecia coronata was to be taken on the trunks of the Sweet Chestnut in scores, while on beating the branches they came out in swarms. In point of num-

bers they reminded one of the green oak moth, Tortrix viridana; in a distance of a hundred yards there must have been thousands. I am quite convinced that there are two distinct natural colours of this species. I have taken both the buff and the green form with their wings limp, before they had spread them out on the tree-trunks. They rest with their wings spread out as if waiting to be placed in the cabinet. The larve must feed on the flowers of the sweet chestnut, as the ground under the trees is quite bare on account of the dense shade. No flowers or undergrowth exist at this part of the wood except the common bracken. At this period the oak trees in some parts of the wood looked like winter, the larvæ of T. viridana were denuding the trees of their foliage and were themselves being devoured by hundreds of rooks and starlings. I took a few Scoparia ambigualis and S. truncicolella and also two of the same genus that I am in doubts about. They both have the marginal band on the upper wings complete and not broken up. Amoebe viridaria (pectinitaria) is rapidly dying out in this district; it used to be very common. The same remarks apply to this species as to Eupithecia coronata, if there are not two natural colours how is it they both retain their colour in the The green form retains its colour in the cabinet, so does the buff form. The common wood carpet Xanthorhoë sociata is still taken here in numbers, but it is a skittish insect to capture. Cabera pusaria was in swarms in July. On July 31st I took another Plusia moneta in my garden in Mansfield. This makes a level half a dozen that I have taken there up till now.

From Aug. 20th to Aug. 24th I paid a visit to Matlock in Derbyshire, but it was wet each day, so that nothing could be done in the way of beating either for imagines or larve. I saw only two Pieris rapae during my visit, and netted only one Xanthorhoë fluctuata and two Camptogramma bilineata. I secured a brood of Aglais urticae and brought them through, but did not obtain a single aberration. Polia chi was found on the walls; in whichever direction I went there were hundreds of them, but I only took two rather dark forms and none of the var. olivacea. I took one P. chi on the church wall at Two Dales and one on the entrance door to Chatsworth House. Charaeas graminis

was flying in Chatsworth Park, but I only took a couple.

On Aug. 25th I visited Quorn, near Loughborough, in Leicestershire, famous, I believe, for fox-hunting, but hunting for Lepidoptera was a different thing. Nothing but common species were taken or Epinephele jurtina, Coenonympha pamphilus, Rumicia phlaeas and Polyommatus icarus were all very common. Pyrameis atalanta and Aglais urticae were now out in fair numbers and had no doubt recently emerged as numbers of larvæ were still to be found. These were possibly a second brood. A number of pupe of A. urticae were found hung up on the stems of the nettle. These were the first I have ever found in such a situation on their food plant. All were of a most beautiful golden colour. I took a number, some for the cabinet, the rest to see if the golden pupæ would produce imagines, as I have always heard it stated that they do not. In my case it was true, for no imago was produced, nor could I see any reason for the failure, as I could find no traces of the pupæ being infested with parasites of any sort.

A friend was going to Southwell Cathedral one Sunday morning

in October when he found a large larva of Cossus ligniperda going across the road at a great pace. He put it in a match-box, a rather tight fit, and took it with him, and on returning to Mansfield gave it to me. My nephew, when digging potatoes in his garden at Quorn, unearthed a fine larva of the same species, no doubt coming from an old willow tree at the bottom of the garden. This was also sent to me. I put them in separate zinc larva-boxes and supplied them with peat which they used at once in making their cocoons. I knew that if placed together they would not scruple to dine off one another without presenting their food card. Whether the Southwell larva was purified by going to service I cannot say, but there is no discernible odour from it. When I opened the box containing the larva from Quorn, it reminded me of Mark Twain, after he had indulged in a Turkish bath, telling the attendant to take him out and bury him, for he must have been dead a fortnight, he stunk so. Cossus, however, was not dead, he showed me his jaws through the end of his cocoon. Up to the present time (April 22nd) neither of them has yet pupated.

In October and November Operabia dilutata were in hundreds. They varied from white ground colour with distinct cross lines to dark quite unicolorous forms. Hibernia defoliaria occurred now in fair numbers; they varied from specimens so much speckled all over with reddish as to give them an almost unicolorous appearance, to the beautiful banded forms with numerous types of ground colour. The two "whites," Pieris rapae and P. brassicae were a pest in the autumn, but their natural enemies made short work of thousands of the larvæ. It was quite a sight to see the abundant masses of little yellow co-

coons studded over doors, walls, window frames, etc.

On Oct. 24th, my grandson brought me a batch of ova of P. brassicae laid on a leaf of Nasturtium. I fed the larvæ on the leaves of garden swede until all pupated at the end of November. The larvæ were kept indoors and they cast their skins only three times. I took every chance of watching them. When about to cast their skins they all clustered together at the top of the breeding-cage. The pupæ, I

note, are rather small.

I had forgotten to mention that an unusally small example of *Mania maura* was sent to me from Quorn in August, which measured only 50 mm. Other specimens I have in my series measure as much as 73 mm.—WM. Daws, Mansfield, Notts. *April*, 1918.

QURRENT NOTES AND SHORT NOTICES.

Hearty congratulations are due, and are hereby tendered, to our esteemed colleague Mr. H. St. J. K. Donisthorpe, upon the promotion of his son to a captaincy in the Royal Engineers, notice of which

appeared in a recent issue of the Gazette.

This establishes what is probably a unique record in the fact that there now appears in the Army List no fewer than five members of the family holding the same rank at the present time, viz., Capt. de Aulâ Donisthorpe (son), Capt. Edmund Russell Donisthorpe (brother), Capt. Anderson de Aulâ Donisthorpe, Capt. Edmund Seal Donisthorpe, and Capt. Henry Donisthorpe (cousins). Fortuna favet fortibus. [H.E.P.]

In the Entomologist for February Prof. Fred. V. Theobald describes a new genus of Aphididae, Truncaphis, in which he places a new species he describes under the name Truncaphis newsteadi, taken in Gloucester and at Camberley. He also describes another new species, Sipha paradoxa, from Rothamsted, on Poa trivialis (among moss). In the same number Mr. R. Adkin writes on the "Abundance of White Butterflies in 1917," and Mr. W. D. Sheldon discusses a cure for specimens affected by verdigris, advocating the use of silver pins for fresh caught specimens, and immersion in toluol for old insects.

In the Bull. Soc. ent. Fr. for January, M. Culot describes a new species of Larentia from the Bernese Alps as Larentia alpinata. It is closely allied to L. miata and L. siterata. M. Culot had previously received the species from the Hautes-Pyrénées. It will be figured in his Iconographie des Géomètres. M. Oberthür announces further specimens of the extremely rare Mamestra renati from the Alpes Maritimes; only one specimen, a female, had been known hitherto of this species from the Pyrénées-Orientales. M. Oberthür also announces that Mr. Harold Powell has bred a Noctuid new to France, viz., the delicate Gracilinalnus enhialtes (nubilaris), a native of Algeria.

In the Canadian Entomologist for January is an obituary notice of Wm. D. Kearfott, who died after an attack of apoplexy in November of 1917, at the age of 53. He was a keen student of the microlepidoptera, and was specially interested in the Tortricidae of North America. It will be called to mind that great objection was taken by many entomologists interested in nomenclature to his long series of peculiarly inappropriate and illiterately fashioned new names. His collection has gone to the American Museum of Natural History.

In the March number of the Irish Naturalist, Mr. T. W. L. Keane writes of the abundance of Lepidoptera in Ireland in 1917. Argynnis paphia in very large numbers, Coenonympha pamphilus common, Hipparchia semele, Pyrameis cardui and Rumicia phlaeas all more numerous than usual; Zygaena filipendulae was swarming, and a specimen of Agrius convolvuli was taken. This was in co. Waterford.

In the *Entomologist* for March, Miss D. Haviland describes a new British Aphid from thistle under the name of *Myzus carthusianus*; it was found at Godalming. Mr. R. Adkin, in his remarks on the abundance of "whites" in 1917, gives a description with a figure of his

aberration of Pieris brassicae with striated apical markings.

In the Ent. Mo. May. for March, Mr. Donisthorpe records a Coleopteron new to Britain, Caenocara (Enneatoma) subylobosa, Muls. It was bred from puff-balls, Lycoperdon, found at Barton Mills in September, 1917. Mr. Jas. Edwards discusses the species of the aquatic Hemiptera of the genus Notonecta. Dr. R. C. L. Perkins commences a Synopsis of the British species of Stylops, and describes the following species as new:—Stylops wilkellae from Woking, S. hammella, parasitic on Andrena chrysosceles, from near Oxford; S. nevinsoni, parasitic on Andrena synadelpha, and S. bimaculatae, parasitic on Andrena bimaculata var. vitrea, from south Devon.

The Naturalist for March contains an account of Yorkshire Entomology in 1917 by Mr. B. Morley, and of Yorkshire Coleoptera in

1917 by Mr. W. J. Fordham, F.E.S.

In the Canadian Entomologist for March, under "Popular Practical Entomology," Prof. Criddle discusses light-traps as a means of con-

trolling insect pests, and gives the results of investigations made in the months of August and September for the past three years. Especial note was made of the moths of the genera Euroa, Feltia and Agrotis, the parents of the various "cutworms." The results are remarkable. The total moths collected only exceeds the number of useful insects (1176) by 196. Male insects in nearly all orders greatly exceed the females. Some of the species of "cutworm" moths collected have by no means been recognised as of economic importance. Taking all this into consideration, the author remarks, "We are left in doubt as to whether this method does not actually do more harm than good."

In reference to the announcement of the capture of *Notodonta* bicoloria in the *Irish Naturalist* of last October, Mr. T. Greer says that the captor, the Rev. G. Foster, took two specimens, beating them out of a small alder wood in the daytime. There was no birch in the

locality.

In the Scottish Naturalist for April, Mr. R. S. Bagnall, F.L.S., gives a series of records of Myriapoda from the Forth area, including a number of additions to the Scottish fauna. Miss Dorothy Jackson gives a long series of Notes on the Aphides of Ross-shire, with the descriptions of two species new to science, viz., Macrosiphum alii, found on leek (Allium porrum), and Pemphigus glebae, of which the food-plant was not ascertained. The latter article is illustrated by one plate and numerous figures of the minute structural details.

In the *Entomologist* for April, Mr. H. Rowland-Brown discusses the Scandinavian forms of *Plebeius argus* and Mr. P. J. Barraud lists the species of Rhopalocera which he had observed in 1916 and 1917 in

Macedonia.

Will our readers who are interested in the preservation of Wicken Fen please note that Mr. H. Rowland-Brown has ceased to be Treasurer of the Wicken Fen Trust. Mr. W. G. Sheldon, the Hon. Treasurer of the Entomological Society of London, has kindly consented to act on behalf of the Trust. Subscribers to the Fund are asked to send their subscriptions and communications to him at "Youlgreave," S. Croydon.

In the Bull. Soc. ent. France for February, M. Moreau reports that Tortrix pronubana, which has been so abundant for the past twenty years around Paris, and the larvæ of which were extremely common in the autumn of 1916, were totally absent in the spring of 1917. He suggests that the long and rigorous winter of 1916-17 was the cause

of this disappearance.

In the *Ent. Mo. Mag.* for April, Dr. R. C. L. Perkins continues his records of British species of *Stylopidae* and describes as new *Stylops analis* from the New Forest, and *S. spreta* from Cambridge, etc. In the genus *Halictoxenus* he describes two other species, viz., H. cylindriei, from the South of England, parasitic on species of *Halictus*, and H. tumulorum, from N. Wiltshire, infesting *Halictus tumulorum*. There is a plate of structural details of the new species described.

Above the initials H.S. in the *Entomological News* for April are some remarks which are quite worth producing. "As to Types.—Perhaps since the following list of kinds of types has gone to the printer it has been increased to at least fifty-seven varieties: Type, Holotype, Allotype, Cotype, Paratype, Syntype, Morphotype, Lecto-

type, Plesiotype, Neotype, Heautotype, Plastotype, Monotype, Chirotype, Apotype, Hypotype, Autotype, Ideotype, Androtype, Gynetype,

Topotype, Orthotype, Haplotype, Logotype and Pseudotype.

"The invention of new names for kinds of types has followed the discovery that the word 'type' in the past had no very exact meaning, and now the pendulum has swung to an absurd degree and has gotten perilously near to perpetual motion. The sensible thing to do would be for someone to grasp the pendulum and swing it back to the word type and give the word its exact present meaning.

"The International Entomological Congress has accepted the principle of the single type. The Entomological Society of America

has thus far not accepted the single type idea.

"It is foolish to expect anyone of ordinary mind to remember the meanings of such an aggregation of verbiage as the above list shows. We would advocate the use of very few of these terms, probably three are quite sufficient for ordinary mortals,—type, paratype, and lectotype. Very learned individuals may wish to go the whole gamut and unfortunately there is no law to prevent people from being foolish. Lectotypes should be established with the greatest care. Even the persons who use all the varieties appear to be a bit hazy as to what they all mean."

In the Naturalist for May, Mr. W. Falconer contributes an article on the Plant Galls of the Huddersfield district. Lieut. Stainforth gives an account of the Woodlice of the Hull district. Dr. J. W. Heslop Harrison, D.Sc., continues his discussion of the subfamily

Bistoninae.

"Accidents will happen," and errors will sometimes unconsciously slip in and equally unconsciously evade correction.* "Hours of idleness" spent in the country during the past few months have given opportunity for a course of more varied reading than for some years past. An admirable series of small treatises The People's Books, have served not only to refresh studies of long ago, but have served to bring many subjects of our human knowledge up to date. In vol. 65 of the series, Pond Life, occurs the following: "The May-fly has many To the fisherman it is the only Diptera worth thinking about," and again in the next section, "Perhaps one of the most curious and interesting Diptera that spend part of their life in the water are Caddis-flies." (The italics are ours.) 'Tis a pity that "Chironomous" is so spelled some nine times in a few pages, and we have never seen the word "fussbush" used except in a page of Comic Cuts. 'Tis also a pity that an uncorrected index has crept into so useful an educational book. The volume is a capital summary of the subject dealt with, giving sufficient detail in many life-histories to arouse and retain the interest of "large numbers of people, who unfortunately miss a great many of the good things of this world. They live their lives without knowing anything of the wonders that surround them." Among other volumes that are especially worth reading are: Foundations of Science, Embryology, Biology, Botany, Bacteriology, Evolution, and Heredity. An outstanding feature of all these little books is the excellent bibliographies.

^{*} A wretched error crept into the last number, p. 100, line 42, where "Rhyncophora" is used for "Rynchota." I have no excuse, not even one of ignorance. It is certainly a lapse, but too bad to call a "lapsus calami."—H.J.T.

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It is with very much pleasure that we congratulate our colleague, Dr. T. A. Chapman, on his election as a Fellow of the Royal Society. Entomologists for years have often expressed the desire to see the "worthy doctor" so honoured, and, on the other hand, Entomology is honoured by his election.

We are pleased to hear that Mr. Stanley Edwards, who has for many years been hon, secretary of the South London Entomological Society, and who is now President, has been nominated for a seat on

the Council of the Linnean Society.

Our old friend Mr. G. B. Routledge, F.E.S., J.P., has been elected to the Presidency of the Carlisle Natural History Society after many

years as Hon. Secretary.

With reference to the concluding paragraph of the review of the Trans. Lond. Nat. Hist. Soc., on p. 78 ante., a correspondent writes: "As a member of both the parent societies as well as of the fruit of their their union, perhaps I may say with authority that it would be rather more correct to say that, as the younger parent was the more alive and active at the time of the union, the new society should more correctly be considered as a continuation of the North London N.H. Soc. than of the City of Lond. Ent. and N.H. Soc., at any rate, I think you owe the junior a little apology in the next Record for overlooking its parentage and superior vitality." Our correspondent points out that there is a reference to the senior parent on the back page of the cover.

We have just heard that the wife and daughter of our valued correspondent Signor Orazio Querci have gone to Sicily to collect during the present season. They are now staying near Monreale, on the slopes of Mt. Cuccio, some miles to the south of Palermo. wish them as much success as they had in their previous expeditions to Elba, to the mountains of central Italy, and in the Florentine hills.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.

THE ANNUAL MEETING.—The Annual Meeting took place on Wednesday, January 16th, 1918, Dr. C. J. Gahan, M.A., D.Sc., President, being in the Chair.

Mr. W. G. Sheldon, one of the Auditors, read the Treasurer's statement of Accounts, which was adopted on the motion of Mr. Stanley

Edwards, seconded by Mr. Frisby.

The Rev. G. Wheeler, one of the Secretaries, then read the Report of the Council, which was adopted on the motion of Mr. O. E. Janson,

seconded by the Rev. F. D. Morice.

No other nominations in addition to those of the Council having been received, the President declared the Officers and Members of the

Council for the ensuing year. See vol. xxix., page 256.

The President then delivered an Address, after which Mr. Simes proposed a Vote of Thanks to him which was seconded by Dr. Eltringham. The President in returning thanks spoke of the neglect of the Biological Sciences on the part of the Government.

Mr. Collin then proposed a Vote of Thanks to the Officers which was seconded by Mr. Donisthorpe, both of whom made special allusion to the regret felt by the Society at the retirement of Mr. Jones from the Treasurership, after so long a period of very efficient work in the Society's interests.

The two Secretaries said a few words of thanks, the Treasurer and

the Librarian being absent.

February 6th.—Nomination of Vice-Presidents.—The President nominated Dr. H. Eltringham, Mr. A. H. Jones, and Mr. S. A. Neave

as Vice-Presidents for the ensuing year.

Election of Fellows.—Dr. John Adams Comstock, Curator of the South-Western Museum, 1275 Bellevue Avenue, Los Angeles, California, U.S.A., and Mr. James W. Monro, Lieut. R.A.M.C., 2nd Sanitary Coy., Duke of York's Head Quarters, Chelsea, S.W., were elected Fellows of the Society.

A BEETLE NEW TO BRITAIN, AND ANOTHER VERY RARE.—Mr. Donisthorpe exhibited a 3 and 2 of Caenocara subglobosa, Muls., a beetle new to Britain which he had bred from a "puff-ball" (Lycoperdon gemmatum) taken at Barton Mills, Suffolk, on September 9th, 1917, together with a specimen (2) of Caenocara bovistae, Hoff. Also specimens of Cryptophagus lovendali, Ganglb., which he had found in large numbers in a nest of Vespa germanica in a tree in Richmond Park on November 20th, 1917; a species of which only two specimens had been taken in Britain before.

Hempterous ova.—Mr. E. A. Butler exhibited ova of the following species of Pentatomidae, Piezodorus lituratus, Fabr., and Pentatoma rufipes, L.; Chorosoma schillingi, Schml., a Coreid bug; two species of Berytus; three Reduviids, Coranus subapterus, L., Nabis major, Costa, and Nabis rugosus, L.; a Capsid bug, Miris laevigatus; and three water bugs, Naucoris cimicoides, L., Notonecta glauca, L., and Nepa cinerea, L.

Two Species of Catagramma, and a new Dynamine.—Mr. Kaye exhibited from Mr. Joicey's collection series of the two Catagramma species C. pastazza and C. excelsior, with races and forms of each, pointing out that the two groups of insects were at once separable by the different tips to the antennae; and a striking new species of Dynamine (D. agatha) from Bolivia.

PSEUDACRAEAS IN MIMETIC ASSOCIATION.—Lord Rothschild exhibited a series of Pseudocraeas in illustration of a paper on the mimetic asso-

ciations of these butterflies.

A NEW FORM OF PSEUDACRAEA POGGEI, DEW., MIMICKING THE DORIPPUS, KLUG, FORM OF DANAIDA CHRYSIPPUS, L., IN EX-GERMAN EAST AFRICA.—Prof. Poulton said he had recently received this form from Capt.

G. D. H. Carpenter.

THE '"FRUIT-FLY' DROSOPHILA AND THE INHERITANCE OF SMALL VARIATIONS.—Prof. Poulton said that Prof. H. S. Jennings, of Baltimore, U.S.A., had remarked "We feel that we have in Morgan's Drosophila a sort of machine for grinding out answers to all sorts of questions in genetics, and now that the question of the inheritance of small variations has been put to it, it yields an emphatic affirmative answer."

Musca autumnalis, De G. (corvina, F.), Hibernating in a loft in the Isle of Wight.—Prof. Poulton exhibited examples of 66 males and 80 females of Musca autumnalis captured 14th December, 1917, in the cistern-loft of St. Helen's Cottage, St. Helens, Isle of Wight.

EPITALIA URANIA, KIRBY ?= POSTHUMUS, F.-Prof. Poulton said that

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he owed to Mr. J. J. Joicey the opportunity of exhibiting the type of the West African E. urania from the collection of the late Mr. H. Grose-Smith, and comparing it with the series of posthumus in the British Museum.

THE Habits of Ethiopian species of Sarangesa and other Hesperidae.—Prof. Poulton read extracts on the above subject from a letter written by the Rev. K. St. Aubyn Rogers, from Kongwa, in ex-German East Africa.

The Sesias mimics and not models of the Hymenoptera.—Prof. Poulton said that he wished to draw attention to an unfortunate misconception in the recently issued part of M. Charles Oberthür's beautiful work, "Études de Lépidopterologie comparée," Fasc. xiv., 1917, p. 131, viz., that the Hymenoptera were mimics of the Sesias.

THE CONSPICUOUS CATOCALINE MOTH EGYBOLIS VAILLANTINA, STOLL, SEIZED AND DROPPED BY A BIRD, AT DURBAN.—Prof. Poulton said that Mr. C. N. Barker had sent to him this observation recorded by Mr.

Harold Millar.

Harpagomyia and other Diptera fed by Cremastogaster ants in S. Nigeria.—Prof. Poulton said he had just received a letter from Mr. C. O. Farquharson, dated 13th December, 1917, from Ibadan, describing this remarkable association in an entirely new part of the world.

March 6th.—Election of Fellows.—Col. Wilfrid Wm. Ogilvy Beveridge, R.A.M.C., C.B., D.S.O. (on active service), c/o J. H. Durrant, Esq., Natural History Museum, S. Kensington, S.W., and Messrs. Patrick Aubrey Hugh Smith, Sconner House, St. German's, Cornwall, and 28, Bruton Street, Berkeley Square, W., and Lionel Julian Walford, the Cavalry Club, Piccadilly, W., were elected Fellows of the Society.

Myrmecophile Diptera collected and the Culicid Toxorhynchites bred by Mr. C. O. Farquharson in S. Nigeria.—Prof. Poulton exhibited these specimens referred to in Mr. Farquharson's notes communicated to the last meeting of the Society, and received at a

later date.

The nidification of Osmia aurulenta, Panz: a correction.—Prof. Poulton said that he had recently received a letter from Dr. G. Arnold, in Bulawayo, correcting the statement that he had bred Osmia aurulenta from whelk shells, on the Wallasey sand-hills. The shells were

a species of Helix, probably nemoralis..

DR. TH. MORTENSEN'S OBSERVATIONS ON THE "FALSE HEAD" OF LYCENIDE AND OTHER BUTTERFLIES, ETC.—Prof. Poulton drew attention to "Observations on Protective Adaptations and Habits, mainly in Marine Animals," published, in English, as one of the papers on Dr. Th. Mortensen's Pacific Expedition, 1914-16 (Vidensk. Medd. fra. Dansk naturhist. Foren, Bd. 69, pp. 57-96, pl. i.), and especially the "Observations on Insects" (p. 83).

A MIMETIC ASSOCIATION OF ITHOMINE BUTTERFLIES AND A RARE DIOPTID MOTH.—Mr. W. J. Kaye exhibited, on behalf of Mr. J. J. Joicey, an apparently very rare Dioptid moth, *Dioptis pellucida*, Warr., and contributed notes on its mimetic association with a group of small

Ithomiine species.

Wasps' and ants' nests from Java.—Mr. Frisby exhibited an ants' nest, and also three cells of Zethus cyanopterus, a wasp of the family Eumenidae, sent by Mrs. M. E. Walsh, F.E.S., from Soeka-

boemi, Java, and read notes. The ants, which were in spirit, appear

to be a species of Polyrhachis.

Longevity of a coleopterous larva.—The President exhibited a Coleopterous larva, together with the box in and on which it had been living for some years. He said that it was the larva of a Longicorn beetle, but was unable to state the species, and observed that similar instances of longevity were on record.

JUGO-FRENATE GENERA OF MICROPTERYGIDE.—Dr. Turner read the following note on Mr. Tillyard's discovery of this wing structure in

certain Australian Micropterygidae.

March 20th.—Election of Fellows.—2nd Lieut. William Proctor Smith, F.Z.S., Haddon House, Ashton-on-Mersey, and Messrs. John Henry Watson, 70, Ashford Road, Withington, Manchester, and Ronald Senior White, Sudugangs Estate, Matale, of the Board of Agriculture, Ceylon, were elected Fellows of the Society.

ELECTION OF AN HONORARY FELLOW. - Dr. Paul Marchal, President of the Entomological Society of France, 89, Rue du Cherche-Midi,

Paris, was elected an Honorary Fellow of the Society.

PAPER.—" Observations on the Lepidopterous Family Cossidae, and on the Classification of the Lepidoptera," by A. Jeffries Turner, M.D., F.E.S.

Dr. Turner gave an abstract of his paper illustrated by drawings of neuration, shown in the epidiascope.

April 3rd.—Election of a Fellow.—Dr. Allan Chilcott Parsons, M.R.C.S., L.R.C.P., D.Ph., Sanitary Officer West African Medical Staff, and Temp. Capt. R.A.M.C., School of Army Sanitation, Aldershot. was elected a Fellow of the Society.

Black form of Pupa of Parange megera.—On behalf of Mr. Prideaux the Secretary exhibited two black and two green living pupe

of P. megera, and read notes.

LICE AND TRENCH FEVER. -Mr. Bacot gave an account of experi-

ments as to the distribution of trench fever by lice.

Androconia in Orders other than Lepidoptera.—The Rev. F. D. Morice inquired whether androconial scales were known in insects other than Lepidoptera. He thought that he had discovered them

among the sawflies in the Australian genus Perga.

The "Tapping" of Anobium Striatum and A. Pertinax.—The President said that he had found that Kirby had mentioned the "tapping" of A. striatum with its mandibles. Also that in the Wiss. Zeit. für Insekten-biologie for 1910 the Danish naturalist Jensen Haarup spoke of A. pertinax as tapping most vigorously before a storm and being regarded in Jutland as a weather prophet. As this was described as taking place specially in autumn and winter, the President considered it probable that the tapping was really made by the book-louse.

Comm. Walker felt sure that he had heard A. striatum tapping

where no X. tessellatum were present.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

February 14th.—Decease.—The death of Mr. G. Brooks, a member of the Council, was announced.

Melanism in defoliaria.—Mr. Bowman exhibited a series of female *Hibernia defoliaria* from Epping Forest, in which the abdomen was jet black.

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METAMORPHOSIS OF NEBRIA BREVICOLLIS.—Mr. Main, an observation cage with the burrow of the beetle *Nebria brevicollis*, and remarked on the abundance of the small mounds of débris from such excavations after the last frost.

ABERRATIONS OF COCCINELLIDS.—Mr. Ashdown, a long series of aberrations of Coccinella hieroglyphica taken in Surrey in 1917, and a curious old book with coloured plates entitled "Dialogues of Entomology," 1819.

AN EARLY ENTOMOLOGICAL BOOK.—Mr. R. Adkin, a copy of Merrit's "Pinax," 1667, one of the first books on the whole of the British fauna.

An African Locust.—Mr. West, the locust Schistocera peregrina

found on a ship from W. Africa.

Variation in Epinephele Lycaon.—Mr. Hy. J. Turner, specimens of Epinephele lycaon, form lupinus, from Cyprus, with typical specimens

from the French Alps for comparison.

Variation in males of Agriades thetis (bellargus) showing gradation in colour development, including a clouded example on which the patches seemed to be formed of scales curled up, when it was looked at obliquely.

The Charus group of the genus Papilio.—The President, various species and forms of the helenus group of the genus Papilio, which Moore has called the sub-genus Charus, including P. chaon, P. helenus, P. juscus (severus), P. iswara, etc.

A Discussion.—A short discussion took place on the "Introduction

of non-indigenous species into the country.'

February 28th, 1918.—Exhibition of Lantern Slides.—The President exhibited slides showing the varied forms of antennæ, wing venation, androconial scales, and other anatomical details of insect structure, and a slide illustrative of "Pædogenesis" in Miastor, a Cecidomyiid (Dip.)

Mr. Dennis, slides showing various devices of plants for seed distribution and of enlarged flowers to show the details of floral structure.

Mr. Bunnett, slides of most of the British Orchidaceae, and of the

pollinia of several species.

An Entomological Book.—Mr. H. J. Turner, a copy of Capt. Browne's "Butterflies, Sphinges, and Moths," 1832, and called attention

to the crude shape and colour of the figures.

EXHIBIT OF CRYPTOGAMS.—Mr. Bunnett, living clusters of the Cryptogams, Jungermannia bidentata and Aulocomnium androgynum, and from the London district the golden saxifrage, Chrysosplenium alternatifolium.

March 14th.—Racial Variation in C. Edusa.—Mr. Turner exhibited Colias edusa var. helice from Cyprus and Spain, including an intermediate form.

GNOPHOS AND SETINA.—Mr. Edwards, a long varied series of Gnophos glaucinaria from Macugnaga, and several species of Setina (Endrosa), S. irrorella, S. aurita, and S. kuhlweini, some having confluent markings.

LIGHT FORMS OF H. MURICATA.—Mr. Barnett, a short series of Hyria

muricata from Guildford, much lighter than the northern form.

N. Brevicollis and its parasite.—Mr. K. G. Blair, the larva of the Coleopteron Nebria brevicollis parasitised by a Proctotrupid. The

larvæ of the parasite were attached full fed for pupation along the back of the host by their tails.

March 28th.—An old Entomological Book.—Mr. Ashdown exhibi-

ed Lister's edition of Goedartius De Insectis, 1685.

Variation in C. Pendularia.—Mr. Newman, a very long fine series of *Cosymbia pendularia* var. *decoraria* (subroseata), bred from ova in January and February, including almost all combinations and permutations of the dark grey and rosy areas.

Variation in P. Pedaria (Pilosaria).—Mr. H. J. Turner, a series of *Phigalia pedaria* (*pilosaria*) from Sherwood Forest, with series from other localities for comparison. He pointed out seven phases of varia-

tion in the specimens exhibited.

The NOX GROUP OF THE GENUS PAPILIO.—Mr. S. Edwards, *Papilio* nox with its forms noctis and noctula, *P. paradoxa* var. caunus, a mimic of a Euploea sp., *P. ilioneus* var. amynthor, and *P. enceladus*, all from

the Malayan region.

Reports on the Season.—Reports were made as to the numbers of Gonepteryx rhamni, Vanessa io, Aglais articae, Pieris rapae and Diurnea fagella seen during the fine and warm weather of the past week. Larvæ of Arctia caja were reported as locally abundant, those of A. villica very scarce. Brephos parthenias was in profusion.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

January 21st, 1918. -The new President, Mr. Wm. Webster, took the chair. Mr. Albert E. Wright, 41, Brookland Road, Burnley, was

elected a member of the Society.

Paper.—Mr. W. Mansbridge communicated a paper entitled "Notes on Breeding Boarmia repandata." The paper dealt with his experimental breeding of B. repandata and gave the results up to date; so far, although the present set of trials dealt with the var. nigra up to the fourth filial generation, the form had not yet bred true. The proportion of the local form of the type varied from 16% to 33% in the different generations, so the experiment is being continued, and when complete or ended owing to failure from inbreeding, the results will be published.

REPORT OF FIELD MEETING.—Mr. W. Mansbridge also contributed a note on the insects taken on the occasion of the summer Field Meeting at Eccleston Mere in June, 1917. The most interesting of these was the occurrence of Choreutes myllerana (scintillulana), Adela degeerella and Argyresthia curvella, these being the first records for S. Lancashire. Another interesting record was the melanic variation of Eupithecia castigata, which, although not uncommon

in S. Lanc., gave a new locality for its occurrence.

EXHIBIT OF EARWIGS.—Mr. W. J. Lucas sent for exhibition the interesting earwigs *Prolabia arachidis* from the bone works at Acton Bridge, Cheshire, a naturalised alien, and *Apterygida albipennis* from Sudbury, and generously presented the specimens to the Society's collection.

EXOTIC HEMIPTERA.—Mr. Rigby, present as a visitor, showed a beautiful selection of exotic Hemiptera, several of which seemed to be "Mimics" of Lepidoptera.

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Desiderata.—Eupithecia nanata var. satyrata, for genitalia only, condition immaterial.—E. A. Cockayne, Surgeon, R.N., R.N. Hospital, Haslar, Gosport,

Duplicates.—Euphrosyne, Selene, Blandina, Aegeria, Hyperanthus, Aglaia, Athalia, Davus, T. quercûs, Corydon, Aegon, Asiliformis, P. populi, Mundana, Moneta* (northern form), Geryon, Z. trifolii, Carpini, Obelisca, Orichalcea (fair), Rufina, Lunosa, Pedaria, Ericetaria, Strigillaría, Ulmata, Didymata, Fumata, Muricata (northern), Albulata, Imbutata, many others. Desiderata.—Vespertaria, Apiciaria, Advenaria, Prosapiaria, Dolobraria, Pictaria, Brunneata, Blomeri, Rubricata, Straminata, Subsericeata, Blandiata, Lobulata, Munitata, Quadrifasciaria, Fluviata, and many others. Blacklpins only.—James Douglas, Thorncote, Chellaston, nr. Derby.

Duplicates.—*Dissimilis, Velleda, Fibrosa, *Ambigua, Fulva, *Lubricipeda var. Fasciata, *Plantaginis, Coracina, Captiuncula, Mundana, Lutosa, Togata, *Valerianata, Cilialis, Inquinatellus, Caledoniana, Variegana vars. Sauciana, Geminana, Cinerana, Brunnichiana, Schulziana, Congelatella, Occultana, Vectisana, Dorsana, Rusticana, *Suboccelana, *Strobilella, Nanana, Herbosana, Petiverella, T. corticella, *Œcop, Fulvigutella, etc. Desiderata.—Good Pyrales, Tortrices, etc.—T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough.

Duplicates.—East African butterflies wanted, butterflies of any country except species occurring in Britain.—W. Feather, Kibwezi British East Africa.

Desiderata.—Pieris napi—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; Pararge ægeria from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—G. T. Bethune-Baker, 19, Clarendon Road, Edgbaston.

Duplicates.—Machaon*, Sinapis, Edusa, Hyale, Valezina, Artemis*, Cinxia, Athalia, C-album*, Polychloros*, Sibylla*, Cassiope, Blandina, Davus, Betulæ*, Artaxerxes, Arion, Actæon, Galii*, Scoliæformis*, Minos, Exulans, Meliloti, Albulalis, Helveola*, Quadra*, Cribrum, Hera*, Fuliginosa*, Fascelina*, Cratægi*, Callunæ*, Trifolii*, Versicolor*, Lapponaria*, Hispidaria, Glabraria*, Abietaria*, Obfuscata, Trepidaria*, Smaragdaria*, Orbicularia*, Auroria, Fumata, Pictaria*, Alternata*, Carbonaria, Pinetaria, Cæsiata, Ruficinctata, Salicata, Pygmæata*, Togata*, Sexalisata, Munitata, Fluviata, Lapidata Undulata, Reticulata, Nubeculosa*, Chaonia*, Or, Flavicornis var. Scotica*, Ridens*, Leporina, Menyanthidis, Myricæ, Concolor, Templi, Agathina*, Conspersa, Barrettii, Occulata*, Tineta*, Glauca, Rectilinea, Peltigera, Melanopa, Cordigera, Interrogationis, Bractea, Craccæ, etc. Desiderata.—Varieties and local forms.—Arthur Horne, Bonn-na-Goille, Murtle, Aberdeenshire.

Wanted, for research purposes, during 1917, ova and larvæ of almost any species of British Lepidoptera. Offered British beetles (many scarce or local) and microscopic mounts.—Geo. B. Walsh, 166, Bede Burn Road, Jarrow-on-Tyne.

Note.—Mr. Donisthorpe will be grateful for any ants from all parts of the British Isles, with localities, unset or otherwise, for the purposes of study.—H. St. J. K. Donisthorpe, 19, Hazlewell Road, Putney, S.W.

I would be very glad to exchange Californian butterflies for English blues especially the variable \Im s, and the blue \Im s of coridon such as have been recorded by Keynes and others.—Fordyce Grinnell, Jr., 712, East Orange Grove, Paradena, California, U.S.A.

Desiderata.—Euchloë cardamines from Ireland; also types of E. cardamines from Switzerland, Italy, S. France; var, turritis (S. Italy), var. volgensis, var. thibetana, and of E. gruneri, F. euphenoides, E. damone, and any palearctic species of the genus. Duplicates.—Lowela dorilis and vars., a few minor vars. of R. phleas (British), and many British lepidoptera.—Harold B. Williams, 82, Filey Avenue, Stoke Newington, N.

MESOPOTAMIA.—I should be glad of information on insects or news of other entomologists in this country.—P. A. Buxton, Fairhill, Tonbridge.

Duplicates.—European butterflies unset on long pins and some set English fashion. Desiderata.—Common British Noctuids.—Hy. J. Turner, 98, Drakefell Road, New Cross, S.E. 14.

Duplicates.—A. coridon vars., including semi-syngrapha, H. Comma. Desiderata.

—A. coridon var. Albicans (Spanish) and var. Hispana (do.), and good butterfly vars., especially from Ireland.—Douglas H. Pearson, Chilwell House, Chilwell, Notts.

Change of Address .- Russell James, Ongar Park Cottage, Ongar, Essex (temporary).

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m.. 1918, October 2nd; 16th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—Meetings: The second and fourth Thursdays in the month a 7 o'clock. June 27th, "Ematurga atomaria." July 13th, Visit to Jno. Innes' Horticultural Institution. Prof. W. Bateson, F.R.S., will conduct the members.—Hon. Sec., Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m.' Visitors invited. Hon. Sec., J. Ross, 18, Queens Grove Road, Chingford, N.E.

Toynbee Natural History Society.—Toynbee Hall, at 8 p.m. Entrance fee 1s., annual subscription 1s. *Meetings*: Full particulars as to excursions can be obtained from the Excursion Secretary, Miss L. Roberts, 11, St. James, Hatcham, S.E. Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in each month from October to April.—Hon. Sec., Wm. Mansbridge, 4, Norwich Road, Wavertree, Liverpool.

East London Natural History Society.—Bromley Public Hall, E. Thursdays at 8 p.m.—Hon. Sec., J. C. W. Shears, 58, Selborne Road, Ilford.

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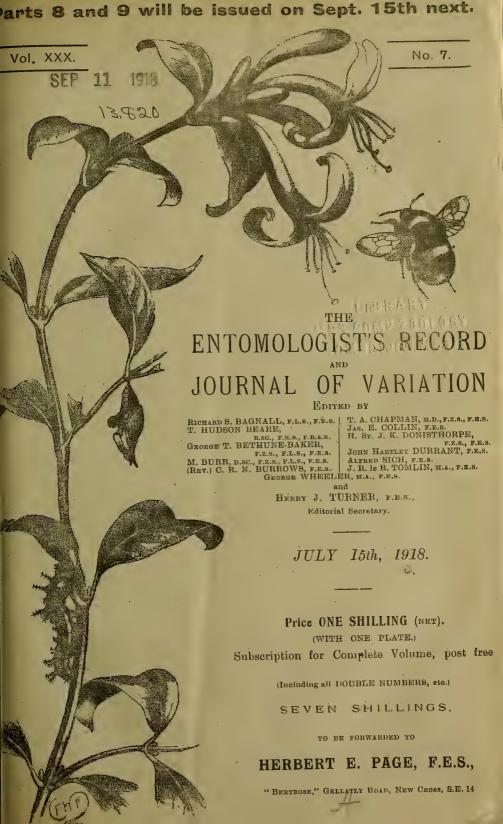
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On the Subspecies and Aberrations of Coccinella 11-punctata L. (With a plate.)

By HORACE DONISTHORPE, F.Z.S., F.E.S.

There appears to be a considerable diversity of opinion amongst Entomologists as to the advisability of giving names to varieties and aberrations of insects—some, such as Sir George Hampson, object to it entirely, others take the opposite view. Others again are inconsistent accepting some and not recognising other such named forms (not wishing such new names to be given, but admitting those which have been already published; and even accepting some such name for one species, and objecting to an exactly parallel form in another species of the same genus having a name).

In an admirable paper read before the Entomological Society of London, on February 6th, 1918, Lord Rothschild showed very clearly the reason for giving names to geographical races and aberrations. With his views I entirely agree, and I propose to quote some extracts

from the paper in question.

"Nomenclature was invented to enable people at a distance and also when in company to discuss the objects of their mutual study in the easiest and shortest manner possible. Now Linnæus, the father of our zoological nomenclature, established the categories of genus and species, and used the word varietas to denote local or geographical race but later authors used the word varietas to denote both local race and individual variation, so the bulk of modern zoologists have abandoned the use of the word varietas altogether. They substitute for it the words subspecies, denoting local or geographical race, and abereration denoting an individual variation . . .

"As to the desirability of naming local races and individual variations, surely the case is its own justification. It is much clearer, much shorter and less cumbersome to say Colias fieldi chinensis than to be obliged to put the 'large Chinese brilliantly coloured race of Colias fieldi,' or the 'broad banded variety without blue submarginal spots of Vanessa antiopa,' instead of Vanessa antiopa ab. hygeia

"The rules laid down by the International Commission on Nomenclature are the only possible ones to be followed, viz., each species must have a generic and specific name, and a subspecies must be treated trinomially by adding the name after the specific name of the typical, or rather nymotypical form, while the names of individual variations should be written after the specific name but preceded by AB."

I will now proceed to consider the subspecies and aberrations of the

Eleven spot Lady-Bird (Coccinella 11-punctata L.).

It may be as well, however, to point out that in any investigation such as this paper deals with, it is absolutely necessary to consult all the original descriptions oneself; as not only are the references, dates and pages often given incorrectly in catalogues, etc., but some authors take the liberty to construe the original descriptions to suit themselves, adding to some parts of them and disregarding others, which not only leads to confusion, but is, moreover, unscientific and inaccurate.

July 15th, 1918.

The following list gives the original description of all the sub-

species and aberrations of Coccinella 11-punctata known to me.

The aberrations appear to be rare, and are usually only found singly. There are very few examples of such forms in the series of this insect in the general collection at the Natural History Museum, and none in the British collection. Some, however, may be represented in private collections belonging to British Coleopterists; as is the case in my own. I give the British records in all such cases as I am aware of, and perhaps if our Coleopterists will examine their series they will be able to add further instances.

Let us state here that it is much clearer, and much shorter and less cumbersome, to say Coccinella 11-punctata boreolitoralis than to be obliged to put "the brightly coloured race of Coccinella 11-punctata with spots two and three, and four and five, on the elytra large and confluent, which is found in the north, in Iceland, Scotland and Ireland, on sand-hills in restricted areas by the sea," and Coccinella 11-punctata ab. confluens, instead of "the variety of Coccinella 11-punctata with the spots two and three on the elytra confluent."!

I have to thank Dr. Chapman and Lord Rothschild for kindly allowing me to quote their views, and Dr. Sharp for kindly lending me his copy of the Bestimmungs-Tabellen der europäischen Coleoptera, ii. Heft. Coccinellidae ii. (J. Weise), 1885; which I was unable to find in

any other library.

Coccinella 11-punctata L., Syst. Nat., 10th edtn. **1,** 366 (1758).

"11-punctata, 11 C. coleoptris rubris : punctis nigris undecim. Faun Svec., 394. Merian europ., 168.

Merian europ., 168. Habitat in Europa.''

This species occurs in Europe, N. Africa, Asia, N. America to California; chiefly in the neighbourhood of the sea.

It is generally distributed and common in the British Isles.

Coccinella 11-punctata L., ab. pura Weise, Bestimmungs-Tabellen, Eur. Col., 29 (1885).

"(b) Fld. einfarbig roth-v. pura Ws."

Coccinella 11-punctata L., ab. tripunctata L., l.c. 365.

 $\lq\lq$ 3-punctata. 3. C. coleoptris rubris : punctis nigris tribus. $Habitat\ in\ {\it Europa}.$

Puncta duo ad apicem coleoptrorum."

Coccinella 11-punctata L., ab. 4-maculata F., Mant. Ins., 1, 56 (1787).

"4-maculata. 30. C. coleoptris rubris: punctis quatuor baseos nigris, thorace atro: macula marginali alba.

Differt manifeste a C. 4-punctata. Caput nigrum punctis duobus baseos pallidis. Thorax niger, nitidus macula marginali, magna, alba.

Elytra rubra punctis duobus 1.1. nigris. Corpus nigrum.

Habitat Halae Saxonum, Dom. Hybner."

Weise [l.c. 110 (1879)] gives the formula for this aberration "P. 3, 5, $\frac{1}{2}$ "; and Ganglbauer [Kafer Mitteleuropa, 3, 1008 (1899)]

writes "... die Punkte 1, 2, 3, fehlen." Neither of these views appear to me to agree with the description of Fabricius.

Coccinella 11-punctata L., ab. peregrina Weise, l.c. 110 (1879).

"bb. P. 1, 5, $\frac{1}{2}$. . . v. peregrina."

The European Catalogue [363 (1906)] incorrectly gives page "23" instead of 110.

Coccinella 11-punctata boreolitoralis n. subsp. (= C. 11-punctata L., var. confluens Donis. [Ent. Rec., 14, 99-100 (1902)] nec. confluens Haworth.

This variety is very brightly coloured, with the basal pair of spots on the elytra (2+3, and 4+5) two and three, and four and five, large and connected by a broad black band. The insect has a very distinct appearance, looking quite unlike the type form and aberrations found further south. It is confined to sand-hills by the sea, in restricted areas in the north.

The following records of this striking looking subspecies may be found:—

"Coccinella 11-punctata L. Specimens all brightly coloured, and the lower pairs of spots on the elytra confluent; four specimens only. All taken near Reykjavik." (Mason) Insects in Iceland, 1889 [Ent.

Mo. Mag., 26, 199 (1890)].

"C. 11-punctata. The only form of this insect which I found is the var. d. of Mulsant, with the side spots large and confluent, called brevifasciata of Weise. I have never seen this form before; it does not appear to have been taken by many English or Scotch collectors. The type form did not turn up at all; the larva occurred on the salt marsh, under sea-weed, rubbish, etc., it is a puzzle to me what it usually feeds on." (Chitty) Cullin Sands, Morayshire [Ent. Mo. Mag., 29, 70 (1893)].

Chitty wrote "var. d of Mulsant" in error for "var. g"; and he

probably intended to write "any," instead of "many" collectors.

"Coccinella 11-punctata, abundant on Machrihanish beach, nearly all the specimens observed having very large and confluent black spots, giving them a very different aspect from southern examples of this abundant species." (Walker.) Cambletown, N.B. [Ent. Mo. May.,

32, 111 (1896).]

"Coccinella 11-punctata var. confluens, n. var. In 1890, in the Ent. Mo. May., p. 199, Dr. Mason records amongst other Coleoptera from Iceland, a form of Coccinella 11-punctata, brightly coloured, and with the lower pairs of spots on each elytron confluent. This reminded me of a specimen sent for me to see by Canon Cruttwell some time ago. He now writes to me, 'It was taken in considerable numbers on a patch of sandy coast near Renvyle, co. Galway, in August, 1899, and quite apart from any colony of the ordinary form, though that also occurred sparingly on other portions of the same coast. I am quite certain of this, for I searched carefully on two occasions expressly to satisfy myself that the common type was really absent from the locality.' Dr. Mason also mentioned that none of the type form were found. Mr. Gorham tells me it is the var. G. of Mulsant, and he further says, 'I think it is a fact that the Coccinellidae tend to vary both ways, par

excès, or par défaut, at the extreme latitudes of their distribution." (Donisthorpe.) [Ent. Rec., 14, 99-100 (1902).]

My name must sink, as Haworth had already described a form of

C. 11-nunctata in 1812 as confluens.

". . . . the var. confluens Donis., occurred in numbers on the sandhills, in a similar place to that in which the Rev. Canon Cruttwell took it in Galway—with us it was accompanied by the type. evidently a regular Irish and Northern form, having been found in Iceland, and then, as with Canon Cruttwell, not accompanied by the type. The larvæ were feeding on Aphis on Lotus corniculatus." (Donisthorpe) Coleoptera in Kerry. [Irish Nat., 12, 62-63 (1903).]

What I referred to as the type is of course an aberration of this subspecies with 11 spots, it was, moreover, very scarce. In the same way, among Chitty's series of this subspecies from Morayshire (now at Oxford), are specimens of an aberration with spots 2 and 3 confluent,

as in the ab. confluens Haw., in the type species.

"C. 11-punctata L., var. confluens Donis. (Ent. Rec., 1902, p. 99). This form has the lower pairs of spots on each elytron confluent, it is also brightly coloured." The localities are then given and we state— "This seems to be the var. brevifasciata Weise, but as that appears to include three different forms, it is perhaps as well to retain Mr. Donisthorpe's name, which is recognised in the last European Catalogue." (The italics are mine.) A very good coloured illustration of this variety is given on Plate xii., fig. 8. (Fowler and Donisthorpe.) [Col. Brit. Isles, Supplement, 6, 105-6 (1913).

"Finally, there remain a few cases which I think we might attribute to the specializing effect of insularity—a factor which possibly explains some of the peculiar forms noted from Lundy and Scilly Islands—for it is obvious that the more circumscribed the area the less chance would there be of any particular variation, arising how it might, from becoming obliterated by free crossing with normal forms. Such is the var. confluens Donis., the only form of Coccinella 11-punctata seen in the island, (W. E. Sharp.) On Coleoptera taken by Donisthorpe on Tiree. [Ent. Rec., 25, 20, 22 (1913).]

This subspecies was abundant in restricted areas, on sand-hills amongst Lotus, on the Isle of Tiree; no aberrations being seen nor

taken with it.

"In Coleopt. Brit. Isl., vi., p. 106, the name of C. 11-punctata var. confluens Donisth., is retained on the ground that it is recognised in the last European Catalogue; but there are at least three reasons why the name in question is untenable: (a) the name confluens is preoccupied for a variety of the same species by Haworth, 1812; (b) the the insect has a prior name, e.g., brevifasciata Weise; (c) the publication of the name was unaccompanied by a description of the insect." (Edwards.) [Ent. Mo. Mag., 50, 143 (1914).]

Mr. Edwards' statement as to the reason why the name confluens is retained in the Supplement (Fowler, vol. vi.) is incorrect, as will be seen above. As to his reasons why he considers the name untenable— (a) is correct, except that Haworth's insect is an aberration and not a variety; (b) is not the case in my opinion, as Weise's name, as I have tried to show, refers to an aberration of the type form; (c) is not the case, as \(\) confluens Donis., is sufficiently described to validate the name,

had it not been invalid as a homonym of confluens Haw.

I submitted the above evidence to my friend Dr. T. A. Chapman, and he writes—"The facts re C. 11-punctata seem from the history you give to be very clear and distinct. There is the type form

1.-11-punctata.

2.—A subspecies, northern and littoral, which wants a name (confluens being preoccupied) implying Northern or littoral, or, if possible, both, would be appropriate.

"1.—C.11-punctata type has certain abs.

1a, confluens Haw. 1b, tamaricis Weise.

Ic, brevifasciata Weise; etc.

"2.—C. confluens Donis., is a distinct race, not an ab., is very like brevifasciata, but differs by having a much higher ground colour. But if it were absolutely identical in facies, it would not alter the fact that it is a race, the other only an ab.

"2.—C. (confluens Donis.), has an ab. parallel to 11-punctata type, but with brighter colouring, and probably has abs. parallel to confluens

Haw., and tamaricis Weise, etc.

"It may be doubtful if these abs. are entitled to the same names as the similar abs. of the type, especially if they have the ground colour of the subspecies.

"Staudinger uses the formula var. et ab., i.e., giving the same name to a race that had been given to an ab. This cannot be sound, what-

ever any authorities may say.

"I assert that a 'race' differs from the typical race if it is geographically distinguishable, but as regards forms represented, need not differ more than by having the several forms in different proportions to those that are present in the type, *i.e.*, all forms in the one may be present in the other, but in different numbers."

Coccinella 11-punctata L., ab. vicina Weise, l.c. 110 (1879). [The European Cat. gives page 23 in error.]

"cc. P. 3, 4, 5, ½; 4 und 5 oft leicht verbunden, v. vicina."

Coccinella 11-punotata L., ab. variegata Weise, l.c.

" dd. P. 2, 3, 5, $\frac{1}{2}$. . . v. variegata."

Coccinella 11-punctata L., ab. litoralis Weise, l.c.

"ee. P. 2, 4, 5, ½ . . . v. litoralis."

Coccinella 11-punctata L., ab. 9-punctata L., l.c. 365.

"9-punctata. 9. C. coleoptris rubris: punctis nigris novem.

Uddm. diff. 14. Coccinella nigra, elytris rubris, punctis novem nigris.

Habitat in Europae Juniperetis."

I swept up a specimen of this aberration in company with the ab. confluens Haw., and the type, at Sandown, I. of W., August 12th, 1913; Oxshott, iv. 16; Mickleham, ix. 16 (Ashdown).

Coccinella 11-punctata L., ab. westmani n. ab. [=Coccinella oculata (Westman). Thunberg Dissertationes Academicae Upsaliae, 3, 117 (1801), Tab. vii., Fig. 18 (described in Dissertatio de Insectis Suecicis); nec Coccinella oculata Thunberg Diss. Nov. Ins. Spec., 14-15 (1781) "Hab. in Capite bonae spei;" nec. Coccinella ocu-

lata F. Ent. Syst., 1 (1) 287, sp. 98 (1792), "Hab. in America borealis.".

 $\lq\lq$ C. oculata Mus. Acad. P. 3. p. 33. diversa a C. oculata Fab. Ent. Syst., p. 287.

Magnitudine C. 5-punctatae. Caput nigrum, flavo-maculatum. Thorax niger, angulo antico flavo.

Elytra rubra: punctis 9 nigris, quorum 1 scutellare commune, 1 in basi, 1 pone medium, 1 in ipso margine antice et 1 intra marginem pone medium singuli

Abdomen uti et pedes nigri."

The European Catalogue gives "oculata Thunb. Diss. 107" as a synonym of the ab. 9-punctata L. The page should be 117, as shown above. We here find there are no less than three species with the name oculata. Fabricius's oculata, 1792, sinks as a homonym Thunberg's 1781. Thunberg's oculata, 1781, is quite a different insect to that of his 1801, and belongs to another genus; the description is as follows:—

"C. OCULATA: Elytris rubris, punctis novem nigris, circulo flavo circum oculos. Fig. 18.

Habitat in Capite bonae spei.

Corpus magnitudine C. 7-punctatae.

Caput nigrum, margine antico et circulo oculorum flavo. Oculi nigri.

Thorax ater puncto in angulo antico utrinque flavo.

Elytra rubra, punctis novem nigris: unum in ipsa costa, unum versus marginem exteriorem ante medium, unum versus suturam in medio elytri, et unum commune in sutura prope basin.

Abdomen et Pedes atra.

Valde similis Cocc. NOVEM-PUNCTATAE; differt vero:

(a) Longitudine fere quadrupla.
 (β) Punctis inverso ordine positis.

(v) Capite immaculato cum circulo oculorum flavo."

Coccinella 11-punctata, L., ab. saloslae Weise, l.c.

"hh. P. 1, 3, 4, 5, ½ . . . v. saloslae."

Coccinella 11-punctata L., ab. cakiles Weise, l.c.

"ii. P. 1, 2, 3, 5, $\frac{1}{2}$. . . v. cakiles."

Ganglbauer (l.c.) spells it with a k.

Coccinella 11-punctata L., ab. obliquesignata J. Müll., Ver. Zool. Bot. Ges. Wien., 51, 521 (1901).

"Es sind hier, wie bei ab. novempunctata, auf den Flügeldecken die Punkte $\frac{1}{2}$, 2, 3, 4, and 5 vorhanden, jedoch fliessen die Punkte 4 und 5 zu einer schragen Makel zusammen." Dalmatia.

Coccinella 11-punctata L., ab. confluens Haworth, Trans. Ent. Soc. Lond., 1, 274 (1812). (=v. longula Weise, l.c.)

"β. confluens, punctis duobus disci anticis confluentibus. Long. Corp. 1²/₄ lin. Varietas rarissima. Communicavit S. Wilkini."

Mr. W. E. Sharp took one specimen of this ab. in company with the type, which occurred in abundance, under bark of palings near the sea at Skegness, in 1912. As before mentioned I swept a specimen at Sandown, I. of W., in 1913. Mr. Ashdown has taken it at Ripley, Oxshott, Mickleham, and Leatherhead. The bands which join the spots together vary in breadth.

Coccinella 11-punctata L., ab. tamaricis Weise, l.c.

"Normalfarbung.

f. P. 4 und 5 bilden eine Querbinde . . . v. tamaricis."

Coccinella 11-punctata L., ab. occilata Churcheville, Mis. Ent. Rev. Ent. Int., 8, 26 (1900). The European Catalogue gives the date incorrectly as "1901."

"Thorax noire avec une tache flave subtriangulaire aux angles antérieurs. Élytres rouges, marquées de 11 points noirs ocellés de jaunâtre : disposés $1, 2, 2, \frac{1}{2}$; dimension 4. Cette forme diffère doncdu type par les ocellations des points, lesquelles lui donnent un aspect fort agréable.

Nous avons capturé cette belle variété sur un Ulex, commune de Bignon (Loire-

Inférieure).

I saw a specimen of this pretty aberration at Barton Mills, on October 6th, 1917, which had just been taken by beating young Scots firs.

Coccinella 11-punctata L., ab. brevifasciata Weise, l.c., 111. The European Catalogue gives the page as "24."

" Normalfarbung.

§. P. 2 + 3, 4 + 5 breit verbunden . . . v. brevifasciata."

In 1885 Weise [l.c. p. 30 (1885)] endeavoured to include his abs. longula (which as has been shown is a synonym of Haworth's confluens)

and tamaricis, with his ab. brevifasciata.

This form is evidently only an aberration, found with the type, of the normal colour, etc. It is evidently the var. δ (var. β . Syst. Cat.) of Stephens [Man 4, 368 (1831)], and the var. G. of Mulsant [Sécuripalpes, 75 (1846)]. Had it been a highly coloured local race found on sand-hills near the sea, Weise, Stephens, and Mulsant, would have stated the fact. Rye [Trans. Leicester Lit. Phil. Soc., 3, 481 (1895)] records a specimen from Swanage of a form of C.11-punctata with "the spots on disc of elytra confluent," and I took it near Millwall Docks on July 4th, 1893, when the type was very common.

Coccinella 11-punctata L., ab. nigrofasciata Rossi, Faun. Etrusca, 1, 62 (1790).

"Coleoptris rubris, punctis nigris octo; fascia media atra. Omnino simillima antecedenti. Differt tantum quod habet ulterius fasciam atram, flexuosam in medio elytrorum a puncto communi baseos enatam."

Edwards (l.c.) states—"Some specimens of C. 11-punctata from Renvyle, co. Galway, given to me by the late Canon Cruttwell, belong to var. nigrofasciata Rossi $(2+3+\frac{1}{2},\ 4+5)$." It is probable that Cruttwell took these specimens in company with my subsp. boreolitoralis (confluens Donis., 1902), in which case they would be an aberration of my subspecies.

Edwards' formula, however, does not agree with Rossi's description, which, as correctly stated by Ganglbauer, has spots \frac{1}{2} and 3

united.

Coccinella 11-punctata menestriesi Mulsant, Spec. Col. Sécuripalpes, 104 (1850); (=aeyyptiaca, Reiche. Ann. Soc. Ent. France, 1861, 212).

[&]quot;Ovalaire. Prothorax noir, paré sur les côtés d'une bordure d'un blanc flave,

plus large en devant, plus étroite sur les deux cinquièmes. Élytres d'un jaune roux, flaves sur les côtés de l'ecusson; parfois unicolores, ordinairement marquées d'une tache scutellaire et chacune de cinq points, noirs: un sur le calus, et deux paires obliques, d'avant en arrière, de dehors en dedans: les externes, vers les deux septièmes et deux tiers de la longueur. Epimères des médi-et postpèctus, blanches."

This subspecies occurs in Egypt, Syria, S.E. Russia, Siberia, and California.

All the above names of vars. and abs. are given in the European Catalogue [363 (1906)], (though some of them, following Weise, are incorrectly given as synonyms), with the exception of boreolitoralis which of course is mentioned as confluens Donis.

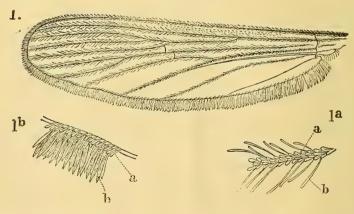
Coccinella 11-punctata L. ab. magnopunctata Rybakow, Hor. Soc. Ent. Ross, 23, 289 (1889).

"Var. magnopunctata m—Die Flügeldecken mit 11 typischen Punkten; es treffen nur $\frac{1}{2}$, 3, und 5 ungemein gross auf, und dadurch ist leicht diese Varietät von allen bis jetzt bekannten zu unterscheiden."

Ganglbauer gives the spots 1/2, 2, and 4 as being larger.

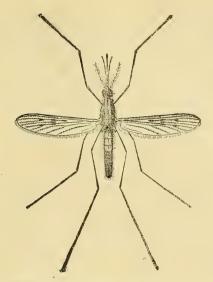
Mosquitoes and Malaria.

By the kind permission of the Trustees of the British Museum we are able to reproduce the following figures, which may still further aid in the identification of specimens, whether they are harmless Culicine gnats or the malaria-carrying Anophelines.

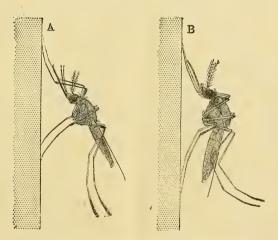


Wing of the Common House-Gnat or Mosquito, Culex Pipiens. × about 16.

- 1a. Portion of 2nd longitudinal vein, greatly enlarged, to show covering of scales.
- a. Median vein-scales.
 b. Lateral vein-scales.
- Portion of hind-margin of wing, greatly enlarged, to show the fringe.
 Border-scales.
 Fringe-scales.



Anotheles maculipennis, M.g. \circ $\times 4$. The carrier of malaria in Southern Europe.



THE SITTING POSTURE ADOPTED BY MOSQUITOES.

A. Anopheles.

B. Culex.

The above figures are taken from a pamphlet entitled Mosquitoes and their Relation to Disease, issued by the Trustees of the British Museum (Nat. Hist.), Economic Series no. 4. Price one penny.

It will be remembered that in a previous number the larvæ of the Anopheles were stated to lie under and parallel to the surface of the water, communicating with the outer air by a series of rosette-shaped tufts situated along the body, by which it is held to the "skin" of the water. The larvæ of other mosquitoes, it was stated, hang head down-

ward, attached to the undersurface of the water-film by a long tube for breathing. At a recent meeting of the South London Entomological Society the different habits of the larvæ of these two sections of the Mosquito family were demonstrated by numerous examples shown by Mr. K. G. Blair, of the British Museum.

It is hoped that in answer to the appeal specimens of gnats from all over the country will be sent in from one and all. If any be sent to me I shall be pleased to forward them to the right quarter and to acknowledge their receipt and the result in the magazine when the identification has been made.—H.J.T.

MOTES ON COLLECTING, Etc.

Early summer on the Surrey Hills.—Advantage was taken of a few days of leisure afforded by Whitsuntide and the extremely fine weather of mid-May to put in some hours on the Surrey hills in the neighbourhood of Redhill and Reigate. A preliminary ramble on business other than entomology showed that Rumicia phlaeas was out in numbers on the Common near Redhill, between the scattered masses of golden broom and gorse, flying over the abundant flower stems of Rumex acetosella here and there displaced by brilliant patches of the small dog violet, Viola canina, the whole scene looking beautifully fresh after the storm of the previous afternoon. A tap on one of the gorse bushes brought out a Taeniocampa stabilis, but nothing else could be stirred. A fence was the resting place of T. gothica, again a solitary capture. Along a road near where some ten years of my boyhood days were spent was a recent cutting in the sand, and I was pleased to see that the sand-martins had already discovered this "coign of vantage" for them and made dozens of excavations for the prosecution of their annual domestic matters. The sand bees were in numbers on the hill where the grass was studded with the small mounds of earth thrown out from their burrows. A solitary Cilix glaucata (spinula) came in the house to the light and subsequently specimens of Eupithecia vulgata and Hemerophila abruptaria were brought to me.

As yet hedges seemed very unproductive for beating produced only Dasycera sulphurella. Although Aglais urticae were flying about, and had been for weeks, there seemed as yet no traces of the larvæ on the abundant and well placed groups of nettles, which however already were contorted by the larvæ of both Spilodes verticalis and Hypena proboscidalis. On a moist common at the foot of the chalk range the "whites" were common and Canonympha pamphilus was noted. Conspicuous here were the large dense patches of blue flowers of Veronica chamaedrys. A neighbouring fence in a lane near by, usually fairly productive, only gave a belated Taeniocampa gracilis. In fact I have found fences and tree trunks of late years particularly unproductive compared with what they were some twenty years ago. On a moist moss-covered wall a beautiful delicate little alien plant, Arenaria balearica, was flowering freely. How this "stray" has got located here is a mystery. Its native habitat, as its name implies, is the far off Mediterranean, and no other spot in Britain has so far as I know been

favoured by its presence.

Turning down an old footpath, one of the many branches of the Pilgrims' Ways, leading out of this lane to some old chalk quarries, to

our disgust we found, what had been a most prolific collecting ground in days of old, enclosed, gardened and built over, I had almost said "devastated," the home of innumerable insects, the spot where the nests of pipits, larks, redstarts, warblers, whitethroats, etc., could each year be found. However not all the area has been "devastated," although the very special spot of thirty years ago for the orchids, the bee and fly, has been absorbed, there is still sufficient area left to harbour many a choice plant and many a local insect, especially as adjoining banks formerly cultivated but for some years abandoned, may be added to the collecting ground. Here an hour or two is spent while the population is sampled and a frugal meal is taken. Gonepteryx rhamni females are about their annual business. Nisoniades tages is very common and very variable, from specimens almost uniform in coloration to others in which there are large areas of light colour producing quite prettily mottled aberrations. Callophrys rubi is still flying, some in excellent condition, and when resting are good exponents of the Ruralid habit of curving the tails of the hind-wings outwards exposing the stronger markings to deceive any aggressive enemy. Hesperia malva (alveolus) is in numbers, quite fresh and apparently just out. They strike one as being somewhat more covered with lighter spots than usual. Polyommatus icarus is out, males only as yet, and as yet only few in number. Male Euchloë cardamines are now quite common, and the usual "whites" are always in sight. A swing of the net at a brilliant gleam of colour proves that early examples of Hypocrita jacobaeae are stirring, and a succeeding stroke at a different gleam shows Aglais urticae still in good condition. The shrubs and bushes, Viburnum lantana, hawthorn in full flower, nut, yew, festoons of traveller's joy, are beaten with very little result. Not a Tortrix is disturbed and only odd examples of Xanthorhoë rivata and Ochyria ferrugata occasionally fly out and, if not netted on the instant, up out of reach. Very swift little gleams of colour are captured to reveal the two species of Pyralida, Pyrausta aurata and P. ostrinalis. A belated female Ematurga atomaria is noted and a few micros are swept from the wealth of early summer flowers and growth, among which the forget-me-not is a conspicuous colour impression. The micros noted here were Cacoesia musculana, Dichrorampha sequana, Ephippiphora brunnicheana, and a specimen of Catoptria ulicetana probably from the gardens. This old haunt of orchid species seems particularly devoid of them so far, but perhaps it is somewhat too early to expect them. move to a long sun-lit bank fringing ground that is now allowed to run wild, however, produced several fine spikes of the man orchid, Aceras anthropophora, while abundant patches of the beautiful little representative of the Family Polygalaceae, Polygala vulgaris, with its white, blue, whitish blue, or lilac flowers, were a pleasing picture.

Crossing the well-known Reigate Hill road, which leads up to the "suspension bridge," a deep cut ancient path, ascending the very steep escarpment of the North Downs in an oblique direction, was taken. How the ensemble of bush and tree and chalk, etc., with the brilliant sky, reminded one of alpine scenes and ascents now unhappily compulsorily foregone, perhaps for some of us never to be renewed! There is however one thing missing, and that is the insect life, for all one sees here is the bright orange of E. cardamines as it crosses above one's head. At the top of the Downs, where the beech reigns supreme,

plenty of Cephalanthera ensifolia are coming up, but not yet showing their white scarce-opening flowers. Lanes and hedgerows at this higher level seem equally unproductive of insect life. Fine clumps of hedgemustard are searched in vain for ova of E. cardamines, and the failure calls to mind that such situations rarely afford a single ovum; close by the scattered plants along the road-side, where the females so love to fly, are dotted as usual with the little yellow atoms. On a roadside bank subsequently are found plenty more of the man orchid, with

Elachista argentella sitting on the grass stems around. What a fortunate thing it is that such a long stretch of the steep North Down slope to the north of Reigate has been acquired as an open space, and still more is it fortunate for the nature lover that so far the so called "improvements of civilization" have not been applied to the "Park." Let us hope that the present regime may continue. Fringed at the top by a muddy, very muddy lane, the upper old Pilgrims' Way, and at the foot by a winding path under overhanging yews and bushes, the lower Pilgrims' Way, the very steep, quite "alpine" slopes are a grand collecting ground for most chalk frequenting species. Here in the season if, and only if, one has nailed boots, can be found abundance of Agriades coridon, A. thetis, Zygaena filipendula, Setina irrorella, etc., etc., among the Macros, while in propitious years Colias edusa will give the very active chances to exploit their agile limbs, and the micros will afford enough to do for many a long hour of setting. "Plumes" and Coleophorids abound in the choice corners of this favoured spot in season, but to-day it is too early for imagines, although one can find Coleophora onosmella cases on the Echium, or C. livella cases on the Holcus grass, and perhaps C. ochrea on Helianthemum vulgare which plant in one or two spots is even in mid May opening its frail but brilliant blossoms. Today want of nailed boots keeps one to the level and the trodden path, and the unusual heat, precursor of the subsequent storm, makes one lazy, on this lower-path. A steep, stony, "alpine" path at the western end of the "acquired" slopes, beyond a hollow I have named "snaky hollow" from its denizens adder, green snake and slow worm, leads, laboriously on such a day, to the top where we reach a secluded, wild corner of an extensive heath land. On this spot between high bushes of hawthorn over brambles, gorse, heather, and last year's fern "brakes," flies a Geometer we expect and find to be Lozogramma petraria, although the ferns are not yet up. A Brenthid suddenly crosses the space and it is found that we have hit upon a spot favoured by Brenthis euphrosyne, which is apparently fully out. The muddy lane, referred to previously, now margined by masses of brilliant blue-bells, is negotiated without acquiring too much earthy matter and the open down is reached, where the welcome breeze meets us accompanied, however, by the intermittent sound (or inward feeling) of distant guns, a reminder of the devilry that is going on across the Here we note Rumicia phlaeas, Canonyympha pam-Channel. philus, Callophrys rubi, Hesperia malva, and Nisoniades tages, which are flying freely. The two Pyralidae are also abundant and The extensive scene, the hot sun, several micros occur sparingly. and the day's exertions have been too much for continued work; and little more is done beyond noting the natural grouping of the plant-life in this highly favoured, not yet, and let us hope never to be, "improved", open space.—H.J.T.

Notes from Macedonia, 1917. — Between March 23rd May 10th, I have had opportunities for doing occasional collecting from four different centres. I have had the good fortune to succeed in capturing every species of butterfly that I am conscious of having seen on the wing. So far, thirty-seven species have been recognised. things go into papers as soon as they are brought home, so that close comparisons are not always possible, and the total may really be About twenty-two of the number I believe to be British, but do not care to venture to give many names at present, as my knowledge of British species is very imperfect, and that of their European allies is practically nil. The thirty-seventh species came to hand only a few days ago, as a badly battered specimen, with only three wings, of Pararge aegeria. A thirty-eighth of probably Macedonian origin, I found in a letter I had for censoring, Aglais urtica, though so far I have not recognised this on the wing. I passed it on as of "no value to the enemy." I have as yet found no locality where any species has been abundant, even Pieris brassicae appearing in quite moderate numbers in village gardens. A few are extremely local, and a certain Chrysophanus I have not yet seen off a three-acre patch. Colias Edusa is widely distributed, but I have only secured two of the var. helice and no others of this genus. The commonest butterfly so far has been a "blue," which I think I recognise as British. It first appeared on March 23rd, and is apparently still hatching. I have seven species of "blues," and six "skippers." Rumicia (Chrysophanus) phlaeas occurs everywhere. This was on the wing when I arrived on March 23rd, and is still going strong. Quite recently I received a quite fresh male which is a very near approach to the form I described from the Canadian Rocky Mountain region under the name arethusa. This differs from the typical form in its larger size and is dark fuscous bronze. I believe it to be the form known in Europe and Asia as eleus. I hope to get more of this.

The only Argynnid so far observed is apparently Issoria lathonia. This has been flying since April 1st, and is still in its prime. Of the Vanessidae I have seen hybernated Vanessa io, Eugonia polychloros, Polygonia c-album, Pyrameis atalanta, and P. cardui. The latter has increased in numbers lately, and can be seen on the wing after sunset. I have seen no Theclid yet except Callophrys rubi, and no Papilio but P. podalirius. Of the three common British "whites," Pieris nani has been very scarce, and I have taken another species unknown to me which recalls the North American sisymbri. It remains to be seen later whether I have P. manni. Leptosia sinapis has not been rare, but is short-lived. Of the moths I have less to say, as I find species even harder to recognise with certainty. Sesia (Macroglossa) stellatarum was on the wing when I arrived. It used to come and look in at the carriage windows when the train stopped. I have seen very few lately, and those badly worn. Saturnia pavonia, one 2 taken, and a few more, probably this species, seen on

the wing.

My list of Noctuidae does not exceed 16 species, about half of those represented by only a single specimen. They include Agrotis (Euxoa) puta, Plusia gamma, Euclidia glyphica, Heliothis armigera (1), H. dipsacea, and Dipterygia scabriuscula (1). As might be expected, the Geometrae have shewn up a little better, and I have probably some

30 species. Anaitis plagiata is amongst the commonest, Camptogramma bilineata has just appeared, and Venilia macularia is locally much in evidence. Of Xanthorhoë (Melanippe) fluctuata and X. (M.) sociata I have only seen two or three specimens, and of Opisthograptis (Rumia) luteolata only one.—(Lieut.) F. H. Wolley Dod, (F.E.S) B.S.F. May 10th, 1918. [Aporia crataegi has become common since I last wrote and I have seen Argynnis paphia.—F.H.W.D.]

FIELD NOTES FROM BATH, 1918.—After reading Mr. Sheldon's excellent account of Peronea cristana in the Entomologist, I made some attempts to find moths hibernating on the stems of hawthorn in hedges. The game however is hardly worth the candle as I only succeeded in getting one moth, a quite good specimen of Acalla boscana var. scabrana, on January 24th, 1918. In the middle of March Xylina ornithopus and a white Tephrosia bistortata were seen at rest on larches at Conkwell. On the 18th Tinea pallescentella occurred in the house. Early in April I picked up a dead but little damaged Amphidasis strataria in Victoria Park. On the 23rd at Bathford the larvæ of Porrittia (Aciptilia) galactodactyla were busy making holes in the burdock leaves. Pammene argyrana on oaks, Lithocolletis corylifoliella on apple, and larvæ of Gracilaria tringipennella in mines on ribwort plantain were noted this month. A fine Acronicta alni emerged on May 4th, the produce of the larva found here last August. Incurraria muscalella was flying over hawthorn in Victoria Park. On the 8th I struck a colony of Laspeyresia perlepidana in a small hollow near a wood at Combe Down. Both males and females were flying briskly in the afternoon sunshine. It occurs in many places round here but is abundant in that hollow. Two days later, at Bathford, many things were on the wing, the only species seen and not mentioned in my notes of last year was Phragmatobia (Spilosoma) fuliginosa. In a lane near the town, on the 11th, I noticed a large bird's dropping on a leaf of Viburnum lantana and should have passed it by but the centre was curiously thin and extended. On examination it proved to be a pair of Cilia glaucata in cop. Except parts of the tarsi of some of the legs no limbs were visible. Everything was tucked away beneath, even the heads. The dark grey thoraces furnished appropriate ends to the false dropping which appeared fresh and moist. Though I looked closely and took a pencil sketch of them, neither moth made the slightest movement. Many species under similar conditions would move away, or even separate. In this lane I also saw Coleophora lineolea mining in the leaves of Stachys sylvatica. On May 14th, in a stone quarry, I searched a patch of oxeye-daisy and found some circular cocoons on the upper sides of the leaves. All had a hole in them and contained a larval skin. They were the cocoonets made by the larva of Bucculatrix nigricomella for the final larval moult. After more searching ten proper cocoons were found. These were not spun on the daisy but on grass growing just outside the patch. They resemble the cocoons of B. cristatella but are I think longer. Nine of these have now produced the moths. I was fortunate in seeing the emergence of one specimen. It pushed the pupa case out of the cocoon, as far as I could judge, nearly half way, and then rather suddenly freed the head, thorax and the limbs, except the ends of the legs. It then rested and again with a sudden movement completed the exit. It retained the wings lying

along the body in the attitude of rest usual to this species until they were fully expanded. It then suddenly threw them over the body like a butterfly, the tips of the forewings just touching each other, the hindwings and body were thus freely exposed to the air. After about seven minutes it again folded the wings along the body in the usual manner. This species emerges in the morning, that is to say my nine specimens did so. The cocoon is spun on grass like that of a Zyyaena and the moth emerges with its back to the grass. In a small wood near the quarry above mentioned Eriocrania subpurpurella and Nemophora schwarziella were noted. On the 18th, near Midford Pammene rhediella was flying over hawthorn blossom, and on the bank of the railway a few cases of Fumea casta (?) were taken off old sleepers and forwarded to the Rev. C. R. N. Burrows. Near the old canal many Lipoptycha saturnana were flying briskly over a patch of tansy in the afternoon sunshine. On a grassy patch just above the platform of the little country station of Midford I found two larvæ of Cosmotriche (Odonestis) potatoria, the only ones I have seen here. Four days later I went to Bannerdown. In the lane Eupithecia coronata was seen at rest and Chrysoclista aurifrontella on the wing, while the first Eucosma pruniana of the season flew out of the blackthorn. At Bannerdown there is a group of fine trees mostly beech and oak. I was surprised to see many pupe of Pieris brassica fixed to the tree trunks from 7-12 feet up. Two had emerged and those I could touch were alive. They were perhaps in rather an exposed position which retarded their emergence. The butterfly has been now at least three weeks on the wing. There were no Cruciferous plants beneath the trees but rubbish had been dumped there, and probably some badly attacked cabbages had been thrown down last autumn. On the 24th, at Combe Down, I saw a Pyrameis cardui chasing another butterfly. They presently settled in front of me, the P. cardui was a 2 and the other was Pararge megera 3. They settled a short time, the P. cardui keeping just behind the other. Then the "Wall" flew off with the P. cardui in hot pursuit. The game continued for some minutes till I lost sight of them. At Bathford Epiblema tedella was shaken out of spruce. They were all very dark. There appears to be a tendency towards darkness in the Lepidoptera here if compared with those found, say, in Surrey. Some light coloured moths flying gaily over a white-thorn at the edge of a wood proved to be &s of Capua favillaceana, and I took one ? off the grass below, as well as Blabophanes ferruginella. A company of small moths was flying about the top of a small hawthern, I netted some and was surprised to find they were Glyphipteryx fischeriella. I have not previously seen this species behaving in this manner. They did not attempt to settle on the twigs but continued dancing in the air. The late Mr. MacArthur told me that in the Shetlands the 3 of Hepialus humuli, after pairing, flew in companies round the tops of the higher rocks. Perhaps the little moths above mentioned were enjoying a post nuptial dance. On the way back I took Bucculatrix boyerella off a nettle leaf near a large elm. On 27th Pammene regiana directed my attention to a sycamore trunk by its bright orange dorsal spot. Shaking spruce firs at Bathford on the 29th, I obtained four specimens of a Blastotere which I believe is glabratella. Their position at rest was not quite the same as that of an Argyresthia. They spread out the anterior and middle pairs of legs and hold the posterior pair more or less along the body, but this is very little elevated so that their head does not touch the surface on which they rest. I think B. illuminatella rests in the same way. A moth in the habit of standing on its head can easily do so on a flat leaf with space around, but this position may not be convenient when resting among fir or pine needles.—Alfred May 31st, 1918.

LIMENITIS SIBILLA IN SURREY. - Sitting in the garden here (Godalming) feeding young pheasants on ants' larvæ, my attention was drawn to a couple of beautifully fresh *Limenitis sibilla* lovemaking on the syringa blossom. This was on Monday, July 8th. This butterfly was dear to my childhood when I counted it a rarity and considered the New Forest its headquarters. I see that South does not give Surrey as one of the localities where it occurs, and shall be interested to learn if there are other records for this county. P. A. H. Muschamp, Charterhouse, Godalming, Surrey. July 10th.

TORTRIX VIRIDANA AT RANMORE.—Being at Ranmore on June 12th I could not help noticing that many oak trees were much defoliated. At one spot some dozen trees were in view that had very little foliage left, and that presented a very brown tint. Of these trees one attracted especial attention. All the cracks in the bark of the trunk were full of the cocoons of Tortrix viridana. So numerous were they that on a selected strip of bark on one side, six inches (6") wide and thirty inches (30") high, 163 (one hundred and sixty-three) cocoons were counted, and they were equally numerous elsewhere on a trunk four or six feet in circumference, and extending upwards as far as could be readily seen. Seated on the trunk up to about nine or ten feet, 64 (sixty-four) imagines of T. viridana were counted, several still expanding their wings. These sixty-four were obviously those that had emerged that morning up to the time of observation (11 a.m. Greenwich time). The moths, so far as could be seen, were equally abundant above, but could not readily be counted. The remarkable circumstance was that, though there were at this spot a good many trees, and at Ranmore generally, a great number of trees denuded of leaves in apparently the same way and to an equal extent as this particular one, on no other tree were there any cocoons on the bark, beyond a few odd ones.

Knowing that T. viridana pupates amongst the leaves of the tree, and often on low plants, to which the larva falls from the tree, a tree was selected because it had some branches within reach, a tree that looked as if punished by larvæ to as full an extent as any other. On this tree cocoons and pupæ were very abundant in the leaves, or what remained of them. The leaves, in fact, had all disappeared, except of most leaves just so much as was necessary to contain the cocoon of

Selecting a twig on an accessible branch of this tree, a twig 16 inches long with three shorter twigs arising from it, the cocoons and pupe on it were counted and found to number 34 (thirty-four). It is difficult from this to calculate how many were on the whole tree. The twig examined was probably less than a thousandth part of the tree, but if so, this would give the tree 30,000 T. viridana chrysalids.

How came it that in the case of the tree first referred to, and that one only of dozens looked at, the Tortrix pupated on the bark. It certainly did not look as if it was defoliated in excess of the others, leaving no places for pupation in the foliages; it was bare enough of leaves, but certain other trees seemed more so.

A fortnight or so earlier, birches and oaks and other trees had plenty of winter geometer (Hibernia, etc.) larvæ, but these were not in evidence on the Ranmore oaks, possibly most had gone down, but the abundance of *T. viridana* showed that their assistance was not at all necessary to produce the devastation observed.—T. A. Chapman, Betula, Reigate. June, 1918.

Tutt's British Lepidoptera, Vol. I.—I was much interested in Mr. Parkinson Curtis' article on Tutt's British Lepidoptera, and can confirm some of his statements. My father gave Stainton on one or two occasions a long list of his captures at Bloxworth, then in the Blandford postal district, and Stainton recorded all these as taken at "Blandford," I remember my father telling me that Stainton was never at Blandford himself, and I think it is safe to assume that Tutt's "Blandford (Stainton)" should really be "Bloxworth (Cambridge)." The case is not so clear in regard to "Wareham." My father collected a good deal in one or two localities just outside that town—especially on the heath in the direction of Morden Park, and in the Water-Meadows between Wareham and Stoborough, and the Wareham records (e.g., of Micropteryx seppella and thunbergella) are, I believe, correct, though the species so recorded were also taken at Bloxworth.

The record given by Tutt for Nepticula salicis, viz., Glanvilles Wootton (Cambridge) is very doubtful, my father was, I think, never at Glanvilles Wootton in the days when he was collecting Nepticulae, and the species is common at Bloxworth. The record was probably made by C. W. Dale. The record of N. ruficapitella from Bloxworth is also an error, and that of N. anomalella covers N. fletcheri as well. "Bloxworth" is also wrongly given by Tutt as a locality for Phryxus livornica; the two specimens in my father's collection were taken respectively at Dorchester in May 1860, and at Warmwell in May, 1904. (It happens that I have been spending my odd time, since his collection came into my possession, in labelling with localities, etc., the specimens about which there is any certain record in his notes or in my own. Unfortunately he did not keep a record of every specimen).

What Mr. Curtis says of Bloxworth as a locality is, of course perfectly true; it owes its extraordinary productiveness to its position at the junction of the heath, the clay and the chalk; and I can also confirm his remark on the fastidiousness of *Noctua ditrapezium* in the

matter of soil.

I should add that Frederick Bond was often at Bloxworth, and knew that it was 9 miles from Blandford, but even he used to record Bloxworth specimens under "Blandford."—A. W. PICKARD-CAMBRIDGE, St. Catharines, Headington Hill, Oxford. June 19th, 1918.

Notes from Dorset.—I have done no collecting yet but have seen a fair amount about. Stauropus fagi $\,\mathcal{J}\,$ sitting on a fence at Parkstone on the 12th June. Bryophila perla on 13th June is early, is it not? but it is coming out freely now. Yesterday at Poole I got

17 Cochlidion avellana (Limacodes testudo) sembling to a wild female, which I stumbled across more or less by accident. I am glad to have established the fact that it is there in fair numbers, but the wood is coming down for aeroplane work. This war is rapidly destroying, what money cannot replace, our beautiful English Woods. My wife and I saw, but failed to catch, though we both did our best, a large butterfly yesterday rather larger than Argynnis paphia and a sandier brown, it flew extremely fast and wildly, not unlike Pyrameis I feel confident it was not Anosia plexippus (archippus), which is a lazy leisurely flier. I have seen that on the wing twice so I know its flight. The insect would be about the size of A. archivpus. but though I know a fair number of exotics, I can't guess its identity, it is very likely to have been an escape, or a liberated insect. It was a Nymphaline of that I feel satisfied (nasty puzzle to meet a butterfly you don't know, and a great vexation to fail to catch it). The flight was nearly as wild as Saturnia pavonia, but more sailing and less buzzy. Pavonia flaps all the time and never banks to turn; this insect banked to turn as Limenitis sibilla does .- W. Parkinson-Curtis (F.E.S.), Parkstone, Dorset. June 24th 1918.

Dates of appearance of Leucania vitellina.—Mr. W. Daws is wrong in his belief that September 20th is the earliest date for the appearance of Leucania vitellina in Britain (Ent. Rec., June, 1918). I have repeatedly taken it before that date on the South Devon coast. A reference to my series gives the dates of the specimens in it as follows. The first three are labelled September 1st to 7th, 1899; the next seven September 16th to October 2nd, 1900, but there is no indication as to how many of them were captured before the 20th; and the last four September 18th, 19th, 23rd and 25th respectively. On September 19th, 1908, Mr. T. A. Lofthouse and I took five and missed a sixth, as I recorded in the Ent. Mo. Mag. of November, 1908, p. 255. All these specimens were taken at sugar on the same ground. I send this note, that Lepidopterists wishing to take this insect may not go for it too late.—Geo. T. Porritt, Huddersfield. June 25th, 1918.

A SWIMMING GRASSHOPPER.—When I was looking for Hemiptera in a pond here, I knocked a grasshopper into the water. It fell about 18 inches from the bank and commenced to struggle, and I then saw it was getting under the water. When it was well under it began to swim, using its hind legs and its front ones, but not its intermediate ones. It swam back to the bank and climbed up a stem out of the water. I put the insect back into the water and let it swim again. The insect was not apparently much exhausted after its swim. I do not know what species of grasshopper it is so I enclose it for examination. Could you return it if possible. I enclose stamps to cover the postage.—G. E. Hutchinson, "Woodlands," Holt, Norfolk. June 20th. [The species is Tetrix bipunctatus. Neither Dr. Chapman nor I were aware of the fact that a grasshopper would apparently be so much at home in the water.—H.J.T.]

Notes from Hyères: the immigration of Pyrameis cardui.—We had a great invasion of Pyrameis cardui along the Riviera at the

beginning of May. They appeared suddenly in swarms, and when I was out on Ascension Day, I saw the butterflies in hundreds feeding on the flowers of Clover, Pittosporum, etc. They were to be seen everywhere; in the plain, along the shore, and on the hills. These cardui, although not fresh, were in fairly good condition. They looked as if they might have left the pupa 15 or 20 days before their arrival here. The question is: "Where did they come from?" I have seen a similar swarm on the Hauts Plateaux in Algeria, in May, and they were in about the same condition as those we had here a month ago. I fancy they must come from very far south, from the Sahara or the Soudan perhaps. The new arrivals laid their eggs on artichoke, on thistles, and on mallows. The artichoke fields in the plain of Hyères have been stripped bare by the larvæ, but the loss to gardeners is not very great, as the flower-heads were fully developed before the plague appeared, and most of them had been cut by the end of May. Millions of larvæ must have starved for want of food. The roads in the plain at the beginning of June were absolutely covered with them, rushing wildly along in search of more food, everything available having been eaten up. The gardeners were very much concerned about this mass of caterpillars, thinking they would attack cultivated plants other than artichoke. Many of them came to me about it and I found it difficult to convince them that they need have no fear of this. Flying with the cardui at the beginning of May were large numbers of *Plusia gamma* and *Nomophila noctuella*. The *P. gamma* were probably immigrants, but it seems hardly likely that *N. noctuella* can have come a long distance, or that it can have crossed the Mediterranean. I wonder if the flight of P. cardui reached England? It would be interesting to know. There will soon be a great emergence of P. cardui on the Riviera. Perhaps another flight north may take place, starting this time from S. Europe.—Harold Powell, Hyères. June, 1918.

British Lepidoptera, Vol. I.—With reference to Kimpton, Dorset, mentioned in the notes by Mr. Parkinson-Curtis on British Lepidoptera, Vol. I. in the June Entom. Record, possibly this may mean Kimpton, Hants, nearest railway station, Weyhill, on the Midland and South Western Joint Ry. It is near Bulford and Tidworth, and possibly on the borders of Dorset.—L. E. Dunster, 44, St. John's Wood Terrace, Regents Park, N.W.8.

EARLY NOTES FROM ONGAR. — As in 1916 the oak trees in this part of Essex are almost denuded of their leaves from the ravages of spring larvæ, although not quite to the same extent as in May of that

year.

The vast majority of the larvæ are those of a grey sawfly and Tortrix viridana, although Cheimatobia brumata and various Hibernia species are also in great force. Among these Hylophila bicolorana has appeared in unusually large numbers. I beat a few large oak trees in open fields on the evening of May 26th, and in half-an-hour or less had obtained thirty larvæ. These commenced to pupate at once and two evenings later the same amount of beating on similar trees resulted in 13 only. I put the difference in quantity down to pupation, as by this time more than half of the larvæ of May 26th had

spun up. I did not try again as by the 30th every larva had made its cocoon, and I believe had I started a week earlier I could have obtained almost unlimited quantities. I have never yet worked for this larva before May 28th, and therefore assume its previous scarcity to be more apparent than real—the great majority having by that time spun up.

Another larva in the district in unusual numbers is that of *Plusia moneta*. On May 18th from three plants of Monkshood in a cottage garden I picked off over 30 larvæ and left many more small ones in the flower-beds. Many of these also commenced to spin at once. Arctia caja and Cosmotriche (Odonestis) potatoria have been obtainable in almost any numbers; forty of the latter being picked off grass at the foot of fifty yards of hedge in a few minutes, and some Aglais urticae are by this date (June 5th) already full fed. So far parasite attacks are not in evidence at all, so there should be a great abundance of perfect insects later on.

In addition to larvæ, spring butterflies have been in more than

usual abundance.

Hibernated A. urticae, Vanessa io, and Gonepteryx rhamni made a marvellous show during the late days of March and the condition of the Vanessidae was wonderful.

I believe this to be due to the fact that the warm June of 1917 brought these two species along so fast that they produced a fairly complete additional brood late in the year which went almost straight into hibernation. This was the case at any rate in this part of Essex. G. rhamni, on the other hand, was in its usual more or less

wasted spring condition.

These have been followed by more than usual abundance of Euchloë cardamines, especially females, and now Nisoniades tages, Rumicia (Chrysophanus) phlaeas, Coenonympha pamphilus, Pararye megera, Heliaca tenebrata, and Euclidia mi are abounding. On the other hand, the Pierids, Hesperia malvae and Celastrina argiolus are decidedly fewer than last year. If this is generally so in the case of the Pierids, it is a matter for congratulation for allotment holders and others, as last year they worked sad havoc among the cabbages and their kindred.—Russell James, Ongar Park Cottage, Ongar. June 5th, 1918.

APATURA IRIS ON ASPEN.—During an evening stroll on Blackdown, Haslemere, on June 1st, I noticed a group of small aspens very much eaten and commenced searching for *Taeniocampa populeti* larvæ, which proved to be not uncommon.

Whilst doing so I found, to my great surprise, a half-grown larva of *Apatura iris*. A very careful search failed to produce another, but this is the only case within my knowledge of *A. iris* feeding away

from its usual food plant.

There was no sallow in the immediate neighbourhood from which it could have come. It continued to eat aspen for the two days I spent at Haslemere, but I have now sleeved it on sallow and it takes readily to the change and is growing rapidly.—ID.

Spring Lepidoptera in Surrey.—On June 2nd I spent three or four hours in a wood not far from the Hampshire border of Surrey and found Leptosia (Leucophasia) sinapis already nearly over.

Things were very forward and Brenthis euphrosyne and Euchloë cardamines were also nearly done. B. selene, on the other hand, were swarming, Nisoniades tages was in most phenomenal numbers and Augiades (Pamphila) sylvanus already well out. On the whole, butterflies were scarcely in such numbers as I have sometimes seen here. Callophrys (Thecla) rubi, Celastrina argiolus and Hamearis (Nemeobius) lucina, amongst others, were very scarce, and of Eulype (Melanippe) hastata only about a dozen were seen, where generally they appear at every turn. Zygaena (Anthrocera) trifolii and Hipocrita (Euchelia) jacobaeae, which were well out, made a brilliant sheen in two meadows, and in a sunny hollow Ruralis (Thecla) betulae larvæ were abundant, half an hour's beating resulting in forty-five and at the same time three Trichiura crataegi.

A useful lot of things were picked up, including Minoa murinata (euphorbiata), Aspilates strigillaria, Numeria pulveraria, Boarmia consortaria, and Anaitis plagiata, and Hemaris fuciformis at blossoms of

ragged robin.

On an earlier visit of two hours only on May 22nd, I found Leptosia (Leucophasia) sinapis in quite its usual numbers, and took a nice series of Ennychia octomaculata, which was abundant in a sunny corner. In all, on these two days, I noted twenty-one species of butterflies alone, and not counting the Apatura iris larva recorded separately from Haslemere.—ID.

Hymenoptera of Cumberland.—Recently I have been working among the Humble-bees and other Aculeate Hymenoptera to furnish further material and records for the Fauna of Cumberland. Yesterday (June 10th) I turned up my first specimen of Bombus distinguendus φ , it is the first time I have seen the insect. Bombus terrestris var. leucorum, B. pratorum, and B. hortorum are all very common here. Bombus terrestris is not so common as its var. leucorum. Queen wasps are this year common, and I have seen Vespa sylvestris, V. rufa, and V. norvegica in this neighbourhood.—G. B. Routledge (F.E.S.), Tarn Lodge, Head's Nook, Carlisle. June 11th.

QURRENT NOTES AND SHORT NOTICES.

Owing to the failure to return proofs it has been impossible to bring out a July-August number this year. Instead we shall issue an August-September number including, through the kindness of Mr. G. T. Bethune-Baker and Mr. John Hartley Durrant, an extra dealing with

the "Tentamen" and the "Verzeichniss" of Hübner.

We have much pleasure in stating that Prof. F. A. Dixey, M.A., M.D., F.R.S., has been unanimously elected as an Honorary Member of the South London Entomological and Natural History Society. The following is a list of the present Hon. Members with the dates when they were elected. Dr. W. Bateson, F.R.S., F.L.S. (1912), Prof. E. B. Poulton, D.Sc., M.A., F.R.S. (1912), and The Right Hon. Lord Walsingham, M.A., F.R.S., F.L.S. (1886).

The University of Michigan has in its entomological library a collection of photographs of the more eminent students of the family

Formicidae.

We understand that a recent addition is that of H. St. J. K. Donis-

thorpe, to whom the felicitations of the Staff and Subscribers of *The Entomologist's Record* are offered herewith.—H.E.P.

The wife and daughter of our correspondent Signior Orazio Querci are going now to collect for a few weeks in the great Sibilini Mountains of the Piceno (1,300m.). As soon as the butterflies taken in the Sicilian trip are set we shall publish an account of the trip and its results.

The Annual Congress of the South-Eastern Union of Scientific Societies held a satisfactory meeting under the Presidency of Sir Daniel Morris, K.C.M.G., at Linnean Society's Rooms, Burlington House, from May 29th to June 1st. There was, as usual lately, but little natural history dealt with. A very interesting, and at the present time most useful discussion took place on "Mosquitos in England," opened by Sir Donald Ross, K.C.B., F.R.S. There was also an afternoon visit to the Horniman Museum, led by Dr. H. S. Harrison. A strong Botanical Section has been formed under the chairmanship of Professor G. S. Boulger, F.L.S., and the Report presented by them recorded much progress. We look forward to the establishment of a Zoological Section under an able chairman in the near future. The success of such sections as these will do much to remove the bias in the Union hitherto supreme, in favour of Archeological Studies. replace the six retiring members of the Council the following were elected by the Delegates to the Congress:—Mr. A. N. Butt, F.R. Hist.S. (Hampstead Soc.); Mr. R. C. Frost (Woolwich Soc.); Mr. J. H. Hopkinson, F.L.S., F.Z.S. (Herts. Soc.); Mr. E. L. Pontifix, M.A. (Tunbridge Wells Soc.); Hr. H. Sparks (Eastbourne Soc.); Mr. Hy. J. Turner, F.E.S. (South London Soc.).

Mr. G. B. Routledge has not been Secretary of the Carlisle Natural History Society, as stated in the last number of the magazine, but has previously been its President. Mr. F. H. Day has been the Secretary

for nearly the whole of the past twenty years.

The Canadian Entomologist for April contains short accounts of the various public and private collections of insects existing in the maritime provinces of Canada, Studies of Canadian Spiders in 1917, with notes and descriptions of many new species of Diptera, Hymen-

optera, etc.

There is a short article in the Ent. News entitled "The Generic Bugbear," which contains a few apt remarks. "Those who refrain from subdividing large genera, on the ground that they are facilitating the remembrance of names, are likely to exaggerate the importance of their service." "The idea that few generic names facilitate remembering is not a fact, and even, if it were true, would be worthless in practical application. You can remember one generic name better than a dozen, but you can not remember one hundred names in one genus as easily as you can one hundred names in a dozen genera." "The generic name does not increase the difficulty of remembering the name of a species any more than the surname increases the difficulty in remembering the name of a man. If every one hundred of your acquaintances had the same surname, do you think you could remember their names more easily?" "The taxonomists who object to genera have adopted the wrong study." "If they distinguish groups which they will not designate with single words, their generic determinations are probably erroneous."

From an article entitled the "Determination of Generic Types in the Lepidoptera" by Sir George Hampson in the December number of the Ent. News, the following quotation is made: "American authors, in the Lepidoptera at all events, and, I believe, universally, are to be congratulated on not having adopted the insidious German specific polynomial nomenclature, by which the specific name is broken up even unto the sixth degree (vide R. Verity's 'Rhopalocera palaeartica'), to which we in Britain have to a considerable extent succumbed of late years." Again, "There is no such thing in nature as a subspecies, if a form is not connected by intergrades with its nearest ally in another locality and does not interbreed with it, then it is a species: if this is not the case then it is a variety, geographical or otherwise, and the term 'subspecies' is merely a confession of ignorance as to whether a form is a species or a variety. The naming of minor varieties is rapidly reducing the whole subject to an unworkable farce, and it is to be hoped that one of the minor benefits of the present war will be that we in Britain will return to a simple binomial nomenclature and purge ourselves from this form of 'Kultur.'"

In the Ent. News for July, 1917, are some Notes on the Earwigs (Dermaptera) of North America, north of Mexico, by Morgan Hebard, Among the species are Labia minor and Forficula auricularia, both importations from Europe. A total of fifteen species are reported and it is remarked that the Order is but weakly represented in the region

treated.

In the Ent. News two swarms of butterflies are recorded. The one occurred on September 4th, 1916, near Eagle Pass, Texas, when the air was fairly alive with swarms of Libythea bachmani (the Snout butterfly), which were flying towards the north. There were said to be literally millions of them. Late in October near the same place several large trees were seen almost covered by swarms of the "Monarch" butterfly, Anosia plexippus. They nearly all left the next day within an hour or so. A little later the willows on the banks of the Rio Grande were the resting places for a still larger swarm. A photo of the latter species on the trees is shown. In the same number (October, 1917) a List of the Butterflies of Iowa is given. It consists of over a hundred species.

There is an interesting account of Sex Attraction in the Ent. News for last October. Females of Zelea polyphemus had emerged and were put out in a cage to attract males if any were in the neighbourhood. At the same time some five or six feet from the cage was a moth trap with a brilliant electric light. Several male moths arrived in due course, but their attention seems to have been distracted from their quest, and instead of going to the cage, or remaining there, if possibly they reached it, they all without exception made their way into the trap. The brilliant light seems to have had so strong an influence upon them as to have counteracted their previous inclination,

rendering it powerless.

The Ent. News for May contains an important article by Prof. J. McDunnough on the vexed question of Nomenclature, in reply to three recent articles by Messrs. H. G. Dyar, G. T. Bethune-Baker, and Sir George Hampson, especially dealing with the validity of the Tentamen of Hübner, the dates of issue of the various parts of Ver-

zeichniss and the Zutraege of the same author, and the subsequent

adoption or rejection of certain names.

In the Ent. News for January there is a summary of some very curious observations on the cocoons of Philosamia cecropia, entitled "Moonstones in a cecropia cocoon." A damaged cocoon of this moth was found in a rut in a road, which contained three moonstones. To this record several previous records are added of a grain of corn being also found in cocoons of the same species at different times during the past fifty years. As to how these objects got into the cocoons is unknown, some were even found with the pupa still in sitü. The blue jay was suggested as the agent depositing the moonstones or corn for safe keeping; other birds which this storing habit, such as the titmouse, the woodpecker, the nuthatch, other jays, etc., have been all suspected. It seems scarcely credible that a mere accident would be the method of deposition in so many cases. Does anyone know of similar records in this country.

In the Bull. Soc. ent. de France l'Abbé J. de Joannis calls attention to and discusses a very curious nomenclatorial point. In 1857, Mann described a species Coleophora drymidis from the neighbourhood of Fiume, the cases of the larve being found on the plant then known as Drymis spinosa and hence the specific name of drymidis. In the course of his study of this species the author of the paper consulted the Index Kewensis, and there found that the botanical genus should be Drimys and not Drymis, and that Drimys is a genus of the Magnoliaceae, a most unlikely group of plants upon which to meet with the larvæ of a Coleophorid. Again, magnolias do not possess spines. Further research pointed to a plant indigenous to the neighbourhood of Fiume, and that was one of the Caryophyllaceae, having the name Drypis spinosa. Still further research led to Stainton's The Tineina of Southern Europe, p. 357, where, although he previously mentions Coleophora drymidis (p. 98), his words are "Drypis spinosa: cases of the larvæ of Coleophora drypidis collected in June on the plant. (At p. 98 I have copied Herr Mann's mistake and printed it Drymis)." In 1891 and 1901 Staudinger copies the error, as does also Spuler in 1910.

In the Ent. Mo. Mag. for May, Dr. R. C. L. Perkins describes a species of Stylops as new to science, by the name of Halictoxenus arnoldi, found on the bee Halictus xanthopus, on a flower of Ulex, in S. Devon. Mr. R. S. Bagnall describes the following new species of Campodeidae, (1) Campodea gardneri, in turf and peat in many places, (2) Campodea westwoodi, at Rhinefield, in the New Forest.

The Entomologist for May contains (1) Descriptions of new forms of Lycaenidae from Egypt, by Capt. P. P. Graves, F.E.S., with a plate of 10 figures. (2) Notes on "blues" occurring near Cambridge. (3) A list of insects found in Burmese amber, and (4) Notes on various

species of Hymenoptera.

We hear with much regret that Dr. Norman H. Joy, of Theale, Berks, who met with a motor-cycle accident on Wednesday, June 26th, had not regained consciousness yesterday.—H.D. July 5th, 1918.

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Desiderata.—Eupithecia nanata var. satyrata, for genitalia only, condition immaterial.—E. A. Cockayne, Surgeon, R.N., R.N. Hospital, Haslar, Gosport.

Duplicates.—Euphrosyne, Selene, Blandina, Aegeria, Hyperanthus, Aglaia, Athalia, Davus, T. quercûs, Corydon, Aegon, Asiliformis, P. populi, Mundana, Moneta* (northern form), Geryon, Z. trifolii, Carpini, Obelisca, Orichalcea (fair), Rufina, Lunosa, Pedaria, Ericetaria, Strigillaría, Ulmata, Didymata, Fumata, Muricata (northern), Albulata, Imbutata, many others. Desiderata.—Vespertaria, Apiciaria, Advenaria, Prosapiaria, Polobraria, Pictaria, Brunneata, Blomeri, Rubricata, Straminata, Subsericeata, Blandiata, Lobulata, Munitata, Quadrifasciaria, Fluviata, and many others. Blackipins only.—James Douglas, Thorncote, Chellaston, nr. Derby.

Duplicates.—*Dissimilis, Velleda, Fibrosa, *Ambigua, Fulva, *Lubricipeda var. Fasciata, *Plantaginis, Coracina, Captiuncula, Mundana, Lutosa, Togata, *Valerianata, Cilialis, Inquinatellus, Caledoniana, Variegana vars. Sauciana, Geminana, Cinerana, Brunnichiana, Schulziana, Congelatella, Occultana, Vectisana, Dorsana, Rusticana, *Suboccelana, *Strobilella, Nanana, Herbosana, Petiverella, T. corticella, *Œcop, Fulvigutella, etc. Desiderata.—Good Pyrales, Tortrices, etc.—T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough.

Duplicates.—East African butterflies wanted, butterflies of any country except species occurring in Britain.—W. Feather, Kibwezi British East Africa.

Desiderata.—Pieris napi—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; Pararge ægeria from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—G. T. Bethune-Baker, 19, Clarendon Road, Edgbaston.

Duplicates.—Machaon*, Sinapis, Edusa, Hyale, Valezina, Artemis*, Cinxia, Athalia, C-album*, Polychloros*, Sibylla*, Cassiope, Blandina, Davus, Betula*, Artaxerxes, Arion, Actæon, Galii*, Scoliæformis*, Minos, Exulans, Meliloti, Albulalis, Helveola*, Quadra*, Cribrum, Hera*, Fuliginosa*, Fascelina*, Cratægi*, Callunæ*, Trifolii*, Versicolor*, Lapponaria*, Hispidaria, Glabraria*, Abietaria*, Obfuscata, Trepidaria*, Smaragdaria*, Orbicularia*, Auroria, Fumata, Pictaria*, Alternata*, Carbonaria, Pinetaria, Cæsiata, Ruficinctata, Salicata, Pygmæata*, Togata*, Sexalisata, Munitata, Fluviata, Lapidata Undulata, Reticulata, Nubeculosa*, Chaonia*, Or, Flavicornis var. Scotica*, Ridens*, Leporina, Menyanthidis, Myricæ, Concolor, Templi, Agathina*, Conspersa, Barrettii, Occulata*, Tineta*, Glauca, Rectilinea, Peltigera, Melanopa, Cordigera, Interrogationis, Bractea, Craccæ, etc. Desiderata.—Varieties and local forms.—Arthur Horne, Bonn-na-Coille, Murtle, Aberdeenshire.

Wanted, for research purposes, during 1917, ova and larvæ of almost any species of British Lepidoptera. Offered British beetles (many scarce or local) and microscopic mounts.—Geo. B. Walsh, 166, Bede Burn Road, Jarrow-on-Tyne.

Note.—Mr. Donisthorpe will be grateful for any ants from all parts of the British Isles, with localities, unset or otherwise, for the purposes of study.—H. St. J. K. Donisthorpe, 19, Hazlewell Road, Putney, S.W.

I would be very glad-to exchange Californian butterflies for English blues especially the variable \Im s, and the blue \Im s of coridon such as have been recorded by Keynes and others.—Fordyce Grinnell, Jr., 712, East Orange Grove, Paradena, California, U.S.A.

Desiderata.—Euchloë cardamines from Ireland; also types of E. cardamines from Switzerland, Italy, S. France; var, turritis (S. Italy), var. volgensis, var. thibetana, and of E. gruneri, F. euphenoides, E. damone, and any palearctic species of the genus. Duplicates.—Loweia dorilis and vars., a few minor vars. of R. phiæas (British), and many British lepidoptera.—Harold B. Williams, 82, Filey Avenue, Stoke Newington, N.

MESOPOTAMIA.—I should be glad of information on insects or news of other entomologists in this country.—P. A. Buxton, Fairhill, Tonbridge.

Duplicates.—European butterflies unset on long pins and some set English fashion. Desiderata.—Common British Noctuids.—Hy. J. Turner, 98, Drakefell Road, New Cross, S.E. 14.

Duplicates.—A. coridon vars., including semi-syngrapha, H. Comma. Desiderata.—A. coridon var. Albicans (Spanish) and var. Hispana (do.), and good butterfly vars., especially from Ireland.—Douglas H. Pearson, Chilwell House, Chilwell, Notts.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1918, October 2nd; 16th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—Meetings: The second and fourth Thursdays in the month at 7 o'clock. July 20th, Visit to the Zoological Society's Gardens. F. W. Frohawk will conduct the members.—Hon. Sec., Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. *Hon. Sec.*, J. Ross, 18, Queens Grove Road, Chingford, N.E.

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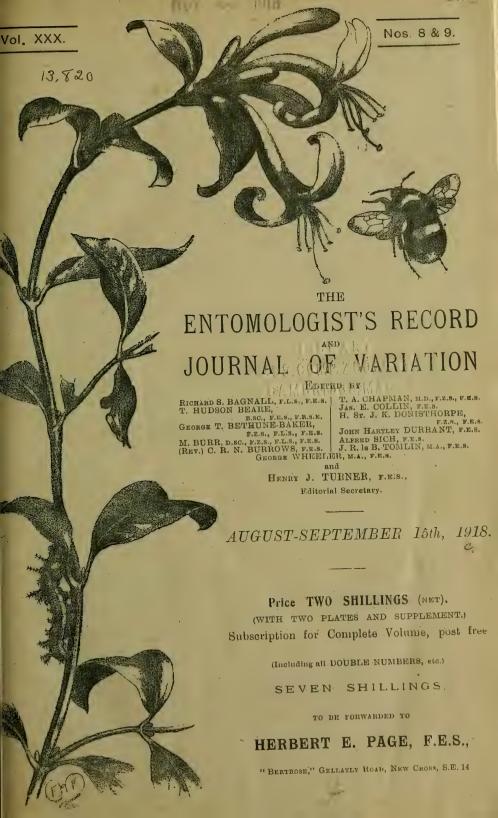
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The Genus Hesperia. (With two plates.) By T. A. CHAPMAN, M.D., F.R.S.

(Continued from vol. xxix., p. 145.)

Various circumstances, of which questions of paper and printing have not been the least, have interfered with the continuation of this exposition of the European Hesperias, founded on Dr. Reverdin's Revision in the Études de Lépidoptérologie comparée, Fasc. xii.

I now offer the plates of the undersides of imagines, that ought strictly to have appeared with the last portion. These are those of five species of the cacaliae group and H. antonia for comparison with H. sidae. These reproductions from Mr. Tonge's photographs are rather pale and weak, and not so satisfactory as those in pl. ix. of vol. 29. Still they show the forms and dispositions of the markings.

These have been already dealt with, so that it is unnecessary to go

over the same ground again.

In the photographs of *H. sidae* and *H. antonia* the two species do not look so much alike as the actual specimens do. The orange in antonia is yellower than in sidae. The effect is a difference in the photographic values that does not strike one at all strongly in the insects themselves, the orange in sidae comes out as very much darker than that of antonia does, so that the photographs make the differences between the two species quite obvious. In the insects themselves the feature of both having orange bands that we hardly expect in Hesperias, impresses one with the resemblances and obscures the differences.

The male appendages of H. sidae and H. antonia show that they

belong to very different sections of the genus.

Varietal and Aberrational Nomenclature. A Protest.

By GEORGE WHEELER, M.A., F.Z.S., F.E.S.

I feel impelled to write a few lines of friendly but emphatic protest against the position taken up by my colleagues, Dr. Chapman and Mr. Donisthorpe, in our July issue (pp. 124, 125), with regard to racial and aberrational nomenclature. Their contention is summed up in the following words written by Dr. Chapman and quoted, apparently with approval, by Mr. Donisthorpe.

"Staudinger uses the formula var. et ab., i.e., giving the same name to a race that had been given to an ab. This cannot be sound, what-

ever any authorities may say.

"I assert that a 'race' differs from the typical race if it is geographically distinguishable, but as regards forms represented, need not differ more than by having the several forms in different proportions to those that are present in the type, i.e., all forms in the one may be

present in the other, but in different proportions."

I cannot imagine a piece of reasoning more unsound, nor a practice which, if followed out, would be more calculated to cause confusion, and to produce a burdensome and quite unnecessary addition to the already somewhat superabundant list of varietal and aberrational names. The only purpose of a name is to make the object named recognisable without a description (as Mr. Donisthorpe allows when quoting with marked approval Lord Rothschild's paper on the subject),

AUGUST-SEPTEMBER 15TH, 1918.

and has nothing whatever to do with the numbers or the proportion to other forms in which the object named may be found. (For instance, an arm-chair is an arm-chair, whether it occurs in the lounge of a Club where it is the dominant form, or as the seat of the President the meetings of the Entomological Society, \mathbf{at} I hold no brief a unique aberration.) where it is Staudinger's Catalogue, and probably few people have spoken or written stronger criticisms upon it than I have, but I am convinced that his expression "var. et ab." is entirely correct, for it is well known to everyone, and the fact is referred to by Dr. Chapman in the passage quoted above, that any form of a species which is racial in any locality is liable to appear as an aberration in others where the dominant form is different, and the same name must apply to all insects of the same facies wherever they come from and in whatever proportions they may happen to be found. Let us follow out the opposite suggestion and see where it must and where it might land us. The blue 2 of Agriades coridon appears in many places as an occasional aberration and is called ab. syngrapha; the corresponding form of A. thetis, which appears in the same way, is known as ab. ceronus; but in some parts of the French department of Charente Inférieure the blue form of the 2 of both these species is racial; we must not then use the aberrasyngrapha and ceronus for these races, and are tional names at once confronted with two new extra names, and shall have an aberrational and a racial name for absolutely identical insects, and furthermore shall never know, unless we possess exact locality data, by which name we are to call any given specimen of the form. In the case of Lycaena arion matters would be far worse. There are a number of named racial forms of this species, most of which turn up as occasional aberrations in other localities, so that the type form may appear in one locality as an aberration of the racial form ligurica, in another as an aberration of the racial form arcina, in another of laranda, etc., etc., etc., and for each of these it ought logically to have a different name, in order that we may know of which racial form it is an individual aberration; and to this would be added new names for each of these local races when they appeared as aberrational forms in the areas where others were dominant. These are merely typical instances representative of hundreds, perhaps thousands, of others. The proposition indeed has only to be stated thus to carry its own refutation. The only alternative is the simple and natural conception of a name as applicable to any and every insect (or other object) of the form to which the name was originally applied, quite independently of the proportion in which the form may appear, the fact that it is aberrational in any given locality being sufficiently notified by the prefix "ab.," which can be omitted in writing or speaking of a locality where it is racial.

Lampronia quadripunctella, Fab., and its aberrations. By ALFRED SICH, F.E.S.

Lampronia quadripunctella is a dusky moth with pale spots. It varies greatly in the number of spots present on the forewing. This variation has prevented some authors from understanding the descrip-

tion given by Fabricius, and consequently caused the naming of certain

varieties as separate species.

I will first briefly explain the position of the pale spots and then notice the more important descriptions of the insect. In fine examples the forewings are dark greyish-brown, and in fully marked specimens there are five more or less distinct pale spots. For convenience I number the spots.

Spot 1 is vertical and rather elongate, and situated on the dorsum

before the middle of the wing; more often present in the 2.

Spot 2, subquadrate or triangular, rises from the dorsum beyond the middle. This is the most conspicuous, and present in all specimens that I have seen.

Spot 3, usually small, just above spot 2, but generally slightly nearer the base of the wing, often connected with 2.

Spot 4, small and triangular, situated on the costa near the apex of the wing.

Spot 5, the smallest, lies between spot 3 and the costa; usually absent.

In 1781, Fabricius describes Tinea quadripunctella as follows:—
"Alis fuscis punctis duobus albidis. Alae anticae omnino fuscae nitidae, punctis duobus in medio approximatis albis, altera ad marginem tenuiorem majori transversa." With two exceptions this diagnosis exactly describes that form of the species which exhibits only the second dorsal spot and the smaller spot immediately above it, that is the only conspicuous spots are 2 and 3. The word "nitidae" seems unsuitable, but if the wings be viewed without the aid of a lens there is a slight sheen visible. In a later description (Ent. Syst., iii., 2, p. 311) this word is omitted. Again, though the spots are not exactly in the centre of the wing, the lower one commences and the upper one lies near the middle. This form with spots 2 and 3 is then the type of the species.

Duponchel describes another form in 1844, under the name of *Incurvaria bipunctella*, he says his moth has two white spots on the inner margin of the forewings, one near the base and the other at the anal angle. He then had the form with spots 1 and 2 conspicuous. Spot 2 is not at the anal angle, but I have seen the original drawing for the figure of this species in Duponchel's work, and it certainly represents this insect and shows the form with two spots on the dorsum, one

before and the other beyond the middle.

Zeller, who captured two specimens at Glogau, and had three others probably sent to him by Stainton, describes the species in 1852. But curiously none of his specimens belonged to either of the forms previously described. He calls his moth Lampronia morosa, and states that it has a small whitish or yellowish triangle at the anal angle, and very obliquely opposite, beyond the commencement of the costal fringe, is an indistinct dot of the same colour. Here then we have a description of that form of the species in which spots 2 and 4 only appear. He also mentions a form with no costal spot, which he calls "variety b." Here all spots but 2 are absent.

Haworth, Stephens, and Stainton all recognised the insect described by Fabricius and employed the name he gave it, but the insect is known

on the continent by Zeller's name, morosa.

The Abbé Joannis, writing in 1915, said that if a specimen of morosa should be found having a pale spot on the dorsum near the base,

it must be concluded that Duponchel's and Zeller's insects are the same

species.

In May, 1916, Mr. Ebray Sich took a fine ? with this spot clearly marked, at Northwood, Middlesex. This specimen was shown to Mr. J. H. Durrant, and it was then seen that several specimens in the British Museum collection exhibited this spot or traces of it. There is no doubt that quadripunctella, bipunctella, and morosa are merely forms of the same species. Had Zeller had a good series of this insect he would not have written the long note he appended to his description of morosa.

The pale spots vary in size, shape, and distinctness. I have seen British specimens of all the five forms mentioned here. The subjoined key many be useful.

1. Spots 2 and 3 conspicuous, there may be traces of other spots . . , quadripunctella, Fab. (Fab., Species Insect., ii., p. 298, 52, 1781).

2. Spots 1 and 2 conspicuous, 3 may be present, if so connected with 2.. ab. bipunctella, Dup. (Dup., Hist. Nat. Lep., Suppl., iv., pp. 513-524, pl. 89, f. 9., 1844).

3. Spots 2 and 4 alone present . . ab. morosa, Zell. (Zell., Linn.

Ent., vi., p. 181, 1852).

4. Spot 2 alone present . . "ab. b" of Zeller. This may be called ab.

unipunctella.

5. Spots 1-5 all visible . . This may be called ab. guinguepunctella n. ab.

Hybrids of Zygaena filipendulae and of Z. lonicerae.

By Hon. H. ONSLOW.

In an interesting note in the April number of the Entomologist's Record, Mr. Bethune-Baker came to the conclusion that "any species of Zygaena found no difficulty in copulating with any other species." This refers to continental races in the wild state, which of course is a very different set of conditions from those experienced in artificial breeding.

Some observations on an attempt to breed hybrids between Z. filipendulae and Z. lonicerae in 1916-17 may not, however, be without

interest

The only record I can find of such hybrids is by W. H. Fletcher, "Notes on hybridising Burnet Moths," in the *Ent. Mo. May.*, vol. 29,

p. 53

In 1916 I procured about 200 males and females of the above species. By judiciously retarding it was so arranged that the insects emerged at the same time. A number of cages were arranged each containing five or six male filipendulae with a similar number of female lonicerae, and vice versa. These cages were filled with flowers and put in the sun. The males of both species made every attempt to pair, flying round and round the females while curving in their abdomens, but their attempts to copulate were in vain, in spite of the fact that the female did not appear to resist. After many failures the males would renew their attempts again and again, sometimes almost succeeding. The proportion of males to females in the cage was frequently varied, and many single pairs were also placed together. Certainly

while watching these efforts it was difficult not to believe that there existed some structural modification of the genitalia which prevented copulation, for as soon as an insect was given a mate of the same species copulation was instantaneously effected. Only one pairing between Z. filipendulae ? and Z. lonicerae & was obtained. It lasted a normal time and the female laid nearly 300 eggs, most of which were fertile.

I had also a few hippocrepidis and trifolii, and obtained pairings between a hippocrepidis $\mathfrak{T} \times trifolii \ \mathcal{T}$, hippocrepidis $\mathfrak{T} \times lonicerae \ \mathcal{T}$, and lonicerae $\mathfrak{T} \times hippocrepidis \ \mathcal{T}$. The first two females laid eggs which were infertile. The last pairing only lasted five minutes, and

no eggs were laid.

The larve of the first cross fed well and hibernated successfully, but owing to a heart-rending accident were all killed just before they began to feed up. A similar attempt was made in 1917, and three pairings were obtained between filipendulae and lonicerae, but none of the eggs were fertile.

On the other hand no great difficulty was found in obtaining pair-

ings between trifolii ? and lonicerae &, which proved fertile.

If any reader were to find five-spot and six-spot burnets in copula, he would be conferring the greatest favour if he would place the insects in a cardboard box lined with moist filter paper firmly sewn to the sides, and would send them to the author, at 3, Selwyn Gardens, Cambridge. The material is required for genetic research work.

[Unfortunately the above did not reach us until after the July number was published, and hence the request is probably too late for

the present season.—H.J.T.]

Field Notes from Macedonia, 1918. I. By Captain M. BURR, D.Sc., F.E.S., Etc.

The following few observations are the continuation of a little series of "Field Notes from Salonika," which appeared in the Entomologist's Record during 1916. Unfortunately, the collection of Orthoptera made in that year was destroyed in the great fire that ravaged Salonika in August last year, together with a quantity of other things that I valued. In 1917, partly from lack of time, and partly from lack of energy, I looked for little, took less, and lost that. All I have to show for last year is the record of a second, as yet unidentified, species of Acrometopa, which I found, together with A. macropoda, in one of the numerous gulches that split the hills on the right bank of the Struma valley; this second species differs from A. macropoda in the decidedly bluish tinge of its colour, in the shorter elytra, which are rounded at the apex, and not obliquely truncate, and the wings do not project beyond them.

It is not gratifying to have spent two and a half summers in so interesting and unworked a country as Macedonia, and to have little or nothing to show for it, so I have resolved for the rest of the present season to do as much collecting as time and circumstances permit. It is very desirable to make some observation on the habits of these creatures, and to make long series of the species which are abundant

here, but unknown in other districts.

By the second half of February it really seemed that spring had begun; we had enjoyed some five or six weeks of fine sunny weather, broken by occasional sand storms, varied with blizzards. On February 11th, Colias edusa was flying freely on the rocky hillsides at the back of Lembet village, and the stones were crowded with a little fluffy black moth, folding its wings penthouse fashion, with strongly pectinate antennæ; mauve and yellow crocuses were springing up all around, and the Egyptian Vulture was soaring overhead, while Partridges and Crested Larks were beginning to discuss their domestic arrangements in the fields.

But a month of wild weather followed; it was not until March 19th that I saw the first hibernated grasshopper, the inevitable Epacromia, on the wing; Pieris brassicae was flying, and big ants had made their appearance. Gryllus domesticus was chirping in our field kitchens, and the Stone Curlew giving his weird whistle in the plains around. On March 28th a violent blizzard stripped all the fruit trees of their

blossom, yet two days later I saw one benumbed Swallow.

By the end of April the weather was milder again, and immature dull black crickets, probably G. burdigalensis, were swarming on the banks of the Struma. Epacromia and Acridium aegyptium were flying freely. On May 4th, Papilio machaon and P. podalirius, and a handsome Thais, were flying freely, Lycaenids were numerous, and a fairly advanced female Poecilimon was picked up near Deve Kran. On the 26th, among the thorn thickets and glades on the north side of Lake Beshik, Thais and Limenitis camilla were observed; the delicate Nemoptera coa, apparently a prey for all raptorial insects, was fluttering helplessly about, and huge horse-flies with great emerald-green eyes, pestered our animals. On an excursion for a few days to the monasteries on Mt. Athos, I was struck by the richness of plant-life, but by the apparent poverty of the fauna; I noticed no Orthoptera, and practically no Lepidoptera, except a couple of Gonepteryx cleonatra.

On June 10th, Glyphanus heldreichi, Br., was mature at Mikra. On the 18th there were clouds of immature Œdipodids and Acridiids on the rocky hills between Lembet and Derbend, and I saw the richly contrasted black and yellow Ascalaphus kolyvanensis dash past; in a mulberry orchard at Derbend there was a colony of Olynthoscelis; I took an adult male, which seems to be O. chabrieri or else one of the closely related species. I had previously been struck by the scarcity of this genus here, for it is abundantly represented in the more northern Balkan countries, and in past years I have taken several species in Wallachia, Hercegovina, Montenegro, and Dalmatia. On June 4th, Mr. F. H. Wolley-Dod called, and we climbed together to the top of a jagged peak in the neighbourhood of my camp, where we saw several Melanargia, the first which he had observed out here. Glyphanus was common, but all specimens from the rocks were of a slaty-blue colour, quite different from the brown ones from the sandy plains; perhaps this is Brunner's second species. Arcyptera flavicosta was freshly adult, as also the purely Macedonian Gampsocleis abbreviatus, Br., an active and ferocious Decticid, which has been referred to in previous notes in these pages. The red-winged form of Celes variabilis was numerous, and Platycleis, of the P. grisea group was swarming, probably representatives of several species. Decticus albifrons is a very conspicuous insect out here, his loud and self-asserting stridulating calling attention to himself on all sides in dry grass and scrub. On June 23rd Captain Campbell, R.A.M.C., brought me a fine series of the slaty-blue Glyphanus from the rocks, but he is not yet able to throw any light on the lemon-yellow and bright blue thigh-linings, brick-red occiput and ultramarine neck-membrane, which are not visible when the creature is in a normal attitude. On June 30th, Major Burstal, R.A.M.C., showed me specimens recently collected by by him at Karaburun; these included practically all species mentioned hitherto, with the addition of several fine Saga vittata, F. de W., and another splendid species without the white stripes of S. and very decidedly larger; this veritable tiger of the Orthoptera-world is very likely S. ephippigera, so far recorded, to the best of my memory, only from Constantinople and Castellastua in Dalmatia, where, in 1901, I went in the hope of finding it, but without success. In the mess tent, after dinner, the characteristic short, sharp buzz, ending abruptly on a higher note, attracted my attention to a fine fresh male Acrometopa macropoda, Ser. The next evening I saw the first adult Caloptenus italicus, L., and in my hut found an adult male Olynthoscelis chabrieri (?) which had strayed in from goodness knows where.

(To be continued.)

Mosquitoes and Malaria. 2.

(The following further notes have been received).

(a) Anopheles maculipennis, the malaria-carrying gnat, does not, as a rule, if ever, pass the winter in the larval stage, and, so far as is known, does not, in the strict sense of the word, hibernate as an adult. The females prefer, even if it is not their invariable custom, to winter in occupied cowsheds, stables, etc., which promise continued food, warmth, and humidity (owing to the presence of animals) throughout inclement seasons.

(b) Anopheles bifurcatus, however, so far as is known, hibernates in

the larval stage.

(c) These habits of the insects make it easy to attack them. They can be driven out in hundreds, and each one driven out will probably die before it can find shelter again.

Hunts organised for this purpose will be found to yield productive

results.

(d) During summer, when the larvæ appear in ditches, swamps, ponds, pools, streams, etc., they may be considerably diminished by clearing such ditches, etc., of weeds and leaving them open to attack.

(e) If the reasons for the investigation and extermination of Anopheles, and the benefit accruing through success, were explained to farmers and other agriculturists, gardeners and land-workers, observers would, in all probability be assisted in their work, and interest, even enthusiasm, in many cases, might be aroused.

(f) While no need for immediate alarm exists, precautions must be taken at once against the possible spread of malaria in this country by Anopheles mosquitoes consequent upon the return of so many

soldiers who have contracted the disease abroad.

(y) Information is also wanted as to the life-history of larvæ in all stages of their existence. All who can give such information are very earnestly invited to do so.

To enable beginners to share in the investigation, it is proposed to

secure the services of experts in various parts of the country and to arrange for a Lecture or a Field Meeting or both. The latter will be particularly valuable as object lessons and for discovering the haunts of the mosquito. If therefore you can furnish me with the names of one or more persons sufficiently au fait with any part of this subject either to lecture or conduct a field party or both or who will undertake to arrange such lectures and field parties, I shall be glad if you will let me know by an early post so that the necessary plans may be made.

If, on the contrary, you desire to be provided with a lecturer or a conductor for a field party, the Committee will endeavour to arrange accordingly on your applying to me. Dates must be left to the con-

venience of the gentleman willing to help in this respect.

Joint meetings, between two or more Societies in the same or adjoining locality, might be concerted. This grouping arrangement would be immensely and mutually strengthening, and conducive to productive and continuous work provided a good leader were chosen.

The Committee urge you to lose no time in beginning operations, and I am sure that you will realise the importance of promptly com-

municating with me.

As stated on page 101 ante, all specimens of Anopheles should be sent by the method therein stated; but if there be a local expert who can identify the specimens it will be sufficient if absolutely authentic particulars of the species of Anopheles and where found are forwarded.—Rev. T. Oswald Hicks (Hon. Sec. Mosquito Committee S.E.U.S.S.), "Lesware," Linden Road, London, N. 15.

SCIENTIFIC NOTES AND OBSERVATIONS.

Paired Lepidoptera in flight.—I have seen an unsually large number of species of paired Lepidoptera in flight during my holiday this summer and on two separate days' hunting earlier and one later in the year. In every case where there could be the slightest doubt as to which sex was carrying the other I have captured the pair and started them off in flight again from the net, so that the following records may be regarded as absolutely certain. The only species seen with regard to which I am not sure, as the pairs were flying too high to be within reach, Pieris brassicae, seen at Guildford, July 29th, and at Prince's Risborough on August 13th, I have not included.

Polyommatus icarus,	May	31st,	2	pairs,	3 carrying ?	, Guildford.
"	July	28th,	1	pair,	,,	,,
Agriades coridon,	Aug.	13th,	1	pair,	,,	Chilterns.
Plebeius aegon,	July	4th,	1	pair,	. ,,	Snodland.
Pieris rapae,	July	28th,	1	pair,		Guildford.
,, ,,	July	31st,	1	pair,	"	,,
22	Augu	st 6th,	1	pair,	,,	Cotswolds.
,, $napi$,	Augus	st 3rd,	1	pair,	,,	21
. ,, ,,	Augus	st 7th,	1	pair,	,,	Wolford.
Dryas paphia,		18th,				Bude.
Aphantopus hyperantus,					2 carrying 3	, Guildford.
Epinephele jurtina,	July	13th,	1	pair,	"	Bude.
" tithonus,	July	24th,			22	Tavistock.
Pararge megera,	July			pair,		Guildford.
Melanargia galathea,	July			pair,		Bude.

Both at Guildford and at Bourton-on-the-Water, in the Cotswolds, I saw several pairs of Zygaena filipendulae on grass stems, the 3 always being below the 2, and tried to induce them to fly, but in vain; failing in this I threw them up into the air, to see which would carry the other when compelled to fly. Owing doubtless to the weight of their bodies they were unable to fly more than enough to guide their descent and prevent themselves from falling; when only thrown a short distance it was invariably the 3 that spread his wings and guided the descent, but if thrown to a greater height the 2 also spread her wings and helped to act as a parachute. I tried the experiment a good many times but always with the same result.—George Wheeler, 37, Gloucester Place, W.1.

Variation in Coccinellidae.—Epilachna corrupta, Mulsant, which abounds at Boulder, Colorado, is one of the comparatively few plantfeeding Coccinellids, and is extremely destructive to beans of the genus Phaseolus. It is very constant in its elytral markings, with eight spots on each elytron. I have not found the variety juncta, Johnson, which has the apical spots confluent. There is, however, at least, in the second generation, a distinct-looking variety with the ground-colour deep brown instead of yellowish, with a distinct metallic coppery lustre on the elytra. It may be called var. cuprea, n. var.—T. D. A. Cockerell, Boulder, Colorado.

OTES ON COLLECTING, Etc.

LIMENITIS SIBILIA IN SURREY.—Mr. P. A. H. Muschamp, in the July number of the *Record* asks if there are other records of this species for Surrey. Last summer (1917) I was in hospital at Holmwood, near Dorking, and on July 17th I saw a single specimen in the woods between Holmwood and Coldharbour. I have also seen the species in several woods in Sussex.—(Lieut.) Harold S. Williams, Victoria Barracks, Belfast. *July* 30th, 1918.

Substitutes for natural food of Pyrameis cardui, etc.—I found the larvæ of Pyrameis cardui at Cibali, Catania, Sicily, enclosed in webs on thistle leaves. As I could not get thistles often enough, the larvæ were practically reared on lettuce leaves. It is very strange how almost any caterpillar will eat lettuce when one cannot get their proper food. I had about six of these larvæ in a box, and on one occasion when they were short of food I found that they started eating one another. In my garden—where I grow vegetables and flowers—I have left a fennel plant to go to seed (the root is eaten here as we do celery in England). On it the other day I found the larva of Papilio machaon.—Percy Sketchley, Catania, Sicily.

A Gynandromoph of Agriades coridon.—On August 3rd last, whilst collecting with my wife on the downs in the Blandford district, I had the good fortune to take a perfectly halved gynandromorphous Agriades coridon, the left wings being male, and slightly smaller, and the right side female. The colouring of the body and head on each side follows the wing. The insect is in perfect condition and was apparently in its first flight.

Tutt, in his British Lepidoptera, records three similar specimens,

one from the same district in 1887, one from Horsley, 1887, and one in the Webb collection.

I also took an example of var. roystonensis, but apart from this all the females were of very ordinary type, and without traces of blue.—S. G. Castle-Russell, "Monkswood," Woking. August 9th, 1918.

The Season at Royston.—We have had various reports or partial reports, verbal and otherwise, from Royston of this season's results in the famous Herts locality. Some say it was not so good for variation, others that plenty of aberrations could be picked up by persistent effort. Mr. Pickett has promised later on to give our readers an account of his sojourn there in the past two years. Meanwhile, he says, "It was a very good year, especially for males; I have never seen such quantities in any year I have been there. Ab. suffusa of Agriades coridon was very common and some lovely forms of it were taken. Ab. fowleri turned up more than usual, as far as I could hear about fourteen were taken. The 'blue' was later in appearing this season and seemed to go over more quickly than usual." "I hear that about twenty collectors went to the ab. syngrapha ground and that not many were taken this year."—H. J. Turner.

LIMENITIS SIBILIA IN SURREY.—With reference to Mr. Muschamp's note under this head, it may be worth while to record that on July 22nd, 1917, I saw a rather worn specimen of this butterfly on Wimbledon Common. If its presence here was not due to human agency, it would be interesting to know what is the nearest locality from which it might be supposed to have come. I noted at the same time that south-west winds had been prevalent for some days.—L. D. Wakely, 34, Lancaster Road, Wimbledon.

QURRENT NOTES AND SHORT NOTICES.

May we ask those of our readers who are members of local Societies that publish Annual Reports, Proceedings, &c., to get their Hon. Secretary to send us a copy for review. Much useful matter, local records, original observations, new facts, or new grouping of old facts, papers of more than local interest, and often figures of rare and new aberrations and species tend to be hidden for years unless an endeavour be made to obtain a more than local dissemination. That wonderful paper of Mendel, which brought into biological investigation an entirely new idea, an entirely new conception of the nature of living things, remained hidden for five and thirty years in the pages of an obscure small local society.

During May appeared the belated parts II., III., and IV. of the Transactions of the Entomological Society of London for 1917. They contains (1) A Revision of the Lycaenid genus Tarucus, by G. T. Bethune Baker, F.L.S., illustrated by seven plates, one of which is coloured. Several new species are described, including one T. mediterraneae from Egypt. There are two species found in the eastern part of the European area, viz., T. balcanica and T. theophrastus. There is especial stress laid on the evidence afforded by the palpi and androconia. (2) Notes on some Hymenoptera from British Guiana, by G. E. Bodkin, B.A., with three plates, illustrating imagines and nests.

(3) Notes on a Collection of Butterflies, sent from E. Africa by Dr. Lamborn, by Dr. Eltringham, Prof. Dixey, and Prof. Poulton. (4) Further Notes on Recapitulatory Attitudes in Lepidoptera, by Dr. T. A. Chapman, F.R.S., the results of many observations "on the methods followed by some Lepidoptera in passing from the attitude of drving their wings after their expansion to their ordinary attitude of He points out that there are "certain positions that are actually, or in some degree recall, the ordinary resting attitude that is not theirs but that of the group to which they belong." (5) A Preliminary Catalogue of the British Cecidomyidae (Dip.), By R. S. Bagnall, F.L.S., and J. W. H. Harrison, D.Sc. This paper deals especially with the Gall-midges of the North of England, and extends over some 80 pages. The record of the ordinary meetings contains among other items (1) A series of Observations on Fossors and their Prey from S.E. Brazil and from E. Africa, communicated by Prof. Poulton. (2) Larvæ of species of Sawfly, with two plates, by Rev. T. D. Morice. (3) The Nuptial Fight of Butterflies, by Dr. T. A. Dixey. (4) A communication from Capt. G. H. D. Carpenter on a synaposematic series of 272 Lycid Beetles of 9 species taken on one plant in late German E. Africa. (5) The "false head" in Butterflies, by Prof. Poulton. (6) The Pupation of Dytiscus marginalis, with three plates, by Mr. Hugh Main, B.Sc. (7) Salt (Chloride of Sodium) probably sought by the *Hesperiidae*, by Prof. Poulton and (8) A study of Papilio polytes race romulus from the extreme South of India and from Singapore, by Prof. Poulton. (9) Mendelian Heredity in Relation to Selection, recent papers produced in America. (10) Pupation of Geotrupes typhoeus, with three plates, by Mr. Hugh Main, B.Sc. (11) Mimicry in Butterflies of New Guinea, by Dr. F. A. Dixey. (12) A discussion on the method adopted by Sir George Hampson of taking the first species mentioned by the author of a genus as the type, with especial reference to the case of the name

The New York Agricultural Experimental Station is apparently as active in its propaganda as in its economic research work, for we are continually receiving booklets issued by the "New York Department of Agriculture, Geneva, N.Y." We can only hope that our "Department of Agriculture" are both carrying on investigations and as active in propaganda as are our transatlantic friends, but we get no knowledge of it, except what can be casually picked up in odd places.

In the Bull. Soc. ent. Fr. for May the Abbé J. de Joannis discusses the observation of Lt.-Colonel Dattin on the case of the hibernation en masse of Lithocolletis populifoliella near Troyes. In mid-March and early April large numbers of the imagines appeared in the houses, etc., but no mass of leaves of the poplar could be found in the neighbourhood from which they could have emerged. It had been noted that in the previous October imagines were quite numerous

in the locality.

The Can. Ent. for June contains 1, An Obituary of Wm. H. Harrington, one of the oldest members of the Ent. Soc. of Canada, and a contributor to the pages of the magazine since its commence-2, The article on Popular and Practical Entomology deals this month with details of the "Experiments with Cutworm Baits." Bran has been used largely with poison bait and has been very effective. In

place of the increasingly expensive bran, sawdust has been tried, but though successful, it is considerably below the effectiveness of the former substance. The effectiveness of various poisons have also been tested; the result shows a slight balance in favour of Paris green over the other arsenic compounds used. The results of various mixtures with the bait, such as molasses, lemon, banana, etc., have also been tested, with a strong favour for lemon extract. 3, A reply to Mr. Wolley Dodd's criticism of their Check List by Messrs. Barnes and McDunnough, in the main accepting the various suggestions of the critic, "one of the most careful students of Noctuidae in America."

The Ent. News for June is mainly taken up with anatomical studies in the Diptera—wing veins of Tipulidae-, Hemiptera—Lopidea of the United States, life-histories of Coleoptera, Diptera, etc., and records of

Odonata, Psyllidae, etc.

The Scottish Nat. for June contains a summary of the occurrence this year up to date of the Camberwell Beauty (Euvanessa antiopa) in Scotland, and the writer raises the suggestion that those captured are almost undoubtedly individuals which have passed the winter in hibernation, as remnants of the extraordinary immigration which visited Britain in the autumn of 1917. There are also a few notes on the occurrence of the dreaded Anopheles maculipennis in Aberdeen.

The Irish Nat. for June gives a long account of Agrius convolvuli in Ireland, referring to the records from Birchall onwards, with special description of its area of occurrence in the prolific year 1917. The writer discusses the possibility of the occurrence of the larve, and says that the records on this stage are noticeably few compared with those

of the imagines.

In the Ent. Mo. Mag. for June, Dr. Perkins gives a long account of the effect of stylopization on the various species of bees attacked, and to this he adds an interesting account of the Assembling and Pairing of the various Stylops species. Mr. P. Harwood adds a new genus and species to the list of British Coleoptera in Scaphium immaculatum, taken in April near St. Margaret's Bay, Kent. Mr. E. A. Butler discusses the close association between Hemiptera-Heteroptera and vegetation in almost every species.

The Entomologist for June contains notes on "The Death Watch," by Dr. Gahan, "The Life-history of Ancyclis uncana," by Mr. W. G. Sheldon, "Contributions to our Knowledge of the British Braconidae" (cont.), by Mr. G. T. Lyle (with several figures), and various notes.

The *Naturalist* for July contains an interesting account of a visit of the Union of Yorkshire Naturalists to Barnard Castle, with notes on insects in all orders observed during the three days spent in the area.

In the Ent. Mo. Mag. for July Mr. D. Sharp discusses the phenomenon of Gynarchy in several families of the Coleoptera, and points out that although well known cases exist in other orders, but little attention has yet been given to the subject in this order. Mr. G. C. Champion announces the discovery of a species of Coleoptera new to the British List in Atomaria zetterstedti, found by Mr. Collins in sallow catkins, near Bedford. Mr. Percy H. Grimshaw records the occurrence of a Dipteron new to Britain, Chortophila pilipyga, an Anthomyid only described last year as new in France. It was taken by Prof. Carr in two localities in Nottingham. Mr. R. S. Bagnall describes two new species of Campodea, C. meinerti, from Manchester, etc., and

C. wallacei from Newcastle-on-Tyne. Mr. Bedwell gives a long account

of the Coleoptera of Suffolk.

The Ent. News for July contains "An Account of the Oviposition of Notonectae" (Hemip.), by H. B. Hungerford; Descriptions of New Genera and species of Lyonetiidae, by Annette F. Braun; a long and detailed account of the Lake Mosquito Mansonia titillans and its hostplant, Pistia statiotes, in the Canal Zone, Panama, an extremely important paper; and notes on various species of Coleoptera, Lepidoptera and Hymenoptera.

The Entomologist for July contains (1) Geometridae in S. Macedonia in 1917, by Mr. P. J. Barraud; (5) "Butterflies of the Somme," by Lieut. Cecil Martin; and a considerable number of general notes.

The Canadian Ent. for July, in its monthly chapter, Popular and Practical Entomology, deals with Popilia japonica, a beetle pest recently introduced from Japan, and especially troublesome in nurseries so far. There are Notes on Coccidae, descriptions of new species of Microlepidoptera, Notes on Central American Heteroptera, Descriptions of new Tipulidae, and some interesting notes on the fly Gasterophilus nasalis, which apparently lays its eggs on the muzzles of horses, so that they will eventually reach the inside of the throat.

The Irish Naturalist for July contains an interesting account of the late W. F. de Vismes Kane, who passed away at the age of 78. He will be known to many of our readers as the author of that most useful little work "The Butterflies of Europe," "remarkable for the condensed diagnoses of the species and for the excellent illustrations reproduced from photographs of perfect and beautiful set specimens by the isochromatic process then recently introduced" For many years he had been a member of the South London Entomological Society.

In the Ent. Mo. May. for August, Messrs. R. S. Bagnall and J. W. H. Harrison announces the following species of Cynipid Oakgalls as new to Britain:— Cynips corruptrix from Co. Durham, Andricus xanthopsis from Co. Durham and Co. Northumberland, A. occultus from the same two counties, A. trotteri from Co. Durham, A. sufflator from Somersetshire, A. rhyzome from Durham, A. nodifex from Durham and Northumberland, A. furunculus from the same two counties, Triyonaspis synaspis and Diplolepsis quercus, both from Durham, and D. flosculi from Northumberland and Durham.

The Entomologist for August deals mainly with Lepidoptera; 1, Collecting chiefly in the Forest of Dean in 1917, by C. G. Clutterbuck; 2, British Odonata in 1917, by W. J. Lucas; 3, A note on "sugars" and the art of sugaring; 4, Another instalment of the list of British

Noctuae, etc.

The Phenological Report, compiled for the "Dorset Natural History Society" for 1916 by the indefatigable W. Parkinson Curtis, has recently been published. The portion referring to the birds contains many notes and observations by Mr. Parkinson Curtis and his brother on the Lepidoptera attacked by the insectivorous species. Nearly twenty pages are taken up by records of Lepidoptera, while "other orders" take up another four pages. Although it is not directly relating to entomology, we note the suggested causes of heath fires in order of importance are—

1. The practice of supplying fire-beaters with beer ad lib.

2. Payment for services rendered in stopping fires.

3. Allowing cottagers and others to hack down dead trees killed by the fires and use them for firewood.

4. Permitting cottagers to graze donkeys, cows, etc., on the sparse

fresh grass which grows after a fire.

5. Sundry causes, mischief, smoking, sparks from engines, etc.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

April 11th.—An exhibition and discussion of the genus Spilosoma.—The President made some general remarks on the distribution of the genus in the Palæarctic Region.

Mr. Ashdown's exhibit included an example of the rare unicolor form of S. lubricipeda with only one slight dot on the costa, from the

Wye Valley.

Mr. R. Adkin, series of various local races of the species and series of crossings between the type and var. zatima of S. lubricipeda, very

fine smoky and heavily spotted S. menthastri, etc.

Mr. Mera, bred series of the species, including many var. radiata and intermediates, some fine var. fasciata and aberrations with dark bodies of S. lubricipeda. He said that the zatima form was originally bred from Lincolnshire larvæ.

Messrs. Kay, Sperring, Leeds, Turner, and Edwards also showed

series.

Mr. B. W. Adkin then exhibited his long series and read a short paper, "The Genus Spilosoma."

April 28th.—Early Breeding.—Mr. Ashdown exhibited Lepidoptera bred this year indoors, including Diaphora mendica, Amphidasis betularia, Amorpha populi, Hylophila prasinana, etc.

SEXUAL DIMORPHISM IN AMERICAN NYMPHALIDS.—Mr. H. Moore, the South American Nymphalids Catonephile acontius and C. batesii,

pointing out their extreme sexual dimorphism.

LIVING LARVE EXHIBITED.—Mr. Edwards, living larvæ of Hepialus humuli, and of a species of Geotrupes (Col.), both dug up at Black-

heath. Mr. Main, living larvæ of Timarcha tenebricosa (Col.).

Variation in Teras contaminana.—Mr. Turner, series of *Teras* contaminana, with var. ciliana, var. rhombana, var. dimidiana, and a much less common form recently pointed out by Mr. Sich (Ent. Record, p. 69).

A LOCUST RAID. - Mr. Bunnett, a photograph of a raid of locusts

approaching a farm in South Africa.

Notes on the season.—Messrs. Edwards, Leeds, Frohawk, and others reported on the season. Vanessa io and Gonepteryx rhamni were in abundance, and Euvanessa antiopa had occurred in Aberdeenshire.

May 9th.—Election of a new member.—Mr. E. E. Green, F.E.S., of Camberley, Surrey, was elected a member.

Surrey coleoptera.—Annual exhibition of orders other than lepidoptera.—Mr. Ashdown, a large number of Coleoptera taken in Surrey and Hants, 1917, including Leptura nigra, L. sexyuttata, Conopalpus testaceus, Orsodacna cerasi, Limonius minutus, Cychrus rostratus, Serica brunnea, etc.

EXOTIC HYMENOPTERA.—Mr. Frisby, two cases of exotic Hymenontera, one with large species of solitary, fossorial, and other wasps, the other with bees from many parts of the world, including a large Megachile, which burrows in the mounds of Termites in South Africa.

British coleoptera and orthoptera.—Mr. West, his collection of British Dytiscidae, Gyrinidae, and Hydrophilidae (Col.), with nearly all the species represented, including the rare Spercus emarginatus from He also showed his British Orthoptera, including Platy-West Ham. cleis roeselii and Nemobius sylvestris from the New Forest.

Sinistral H. nemoralis.—Mr. Priske, sinistral specimens of Helix nemoralis (Mol.) from Bundoran, and many British freshwater shells.

EXHIBIT OF LARVA OF C. CAMPESTRIS AND OF THE BRITISH TRAP-DOOR SPIDER.—Mr. Main, a living larva of Cicindela campestris (Col.) from Epping in its burrow, and the burrow and aerial tube of the trap-door spider, Atypus affinis.

COLOUR IN THE GROUP ORTHOPTERA .- Mr. Moore, a number of species of Orthoptera and read notes on the colours found in the

Order.

Insects taken on a voyage to Australia.—Mr. Buckstone, a collection of Hymenoptera, Orthoptera, and Coleoptera made on a voyage to

Australia some years ago.

Carriers of Disease.—Mr. Talbot, living examples of Pediculus humanus, which carried the bacillus of trench fever, and Stegomyia fasciata, the carrier of yellow fever, and showed the ova of the latter hatching.

Exotic Coleoptera.—Mr. Edwards, large species of Exotic Cole-

optera.

THE SOCIETY'S COLLECTIONS.—Mr. West, for the Society drawers of British Odonata, Hemiptera, Hymenoptera, Diptera, and Carabidae (Col.).

GREAT ABERRATION IN MARKINGS OF BIRD'S EGGS.—Mr. Frohawk. varied series of the eggs of the blackbird, thrush, goatsucker, and

lapwing.

May 23rd.—Early stages of Coleoptera.—Mr. Main exhibited the pupa of Ocypus olens (Col.) in the pupal chamber, and pointed out the strong spines which prevented direct contact with the earthen sides. He also showed the larva of Timarcha tenebricosa ready for pupation on its back in the cell.

AN OLD ENTOMOLOGICAL BOOK.—Mr. Ashdown, Albin's Natural History of English Insects, 1720, one of the first coloured English ento-

mological works.

STEREOSCOPIC SLIDES.—Mr. Dennis, stereoscopic slides of Tortrix cristana, etc.

Mosquitos. —Mr. Main, Anopheles bifurcatus and other mosquitos. WICKEN FEN FUND .- Mr. Adkin asked for support for the "Wicken Fen Fund," indicating the object of the Fund and what had been done so far.

A MELANIC FORM OF ALSOPHILA AESCULARIA AND ABERRATION IN PYRAMEIS ATALANTA.—Mr. H. J. Turner exhibited a melanic form of A. ascularia from Mansfield, and specimens of P. atalanta from Cornwall and S.E. Ireland, in which the red band of the forewings was much paler than in Central England examples.

EXHIBITION AND DISCUSSION OF MIMAS TILIAE.—The remainder of the evening was spent in an exhibit and discussion of Mimas tiliae,

introduced by Mr. Sperring.

Messrs. Leeds, R. Adkin, and Sperring exhibited their series of M. tiliae. Mr. Leeds, a wild captured ab. suffusa and a number of ab. maculata. Mr. R. Adkin, series of local races, a long graduated series of modifications of the central transverse band, and gynandromorphous examples. Mr. Sperring then read his notes dealing with Nomenclature (shortly), Ova, Larva, Pupa, Time of Emergence, Assembling, Pairing, and Variation, the last in some detail. A discussion ensued, Messrs. R. Adkin, B. Adkin, S. Edwards, W. West, Dennis, Main and others taking part.

Mimas tiliae was noted as being a very common insect in the larval stage, until recently invariably attached to lime trees, feeding well on birch, formerly common in the pupal stage at the foot of oaks in Greenwich Park, recently commonly attached to elms, always small when bred from elm trees, occurring in Hyams Park on alder, etc.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

February 18th.—The New Cidaria, C. otregiata.—Mr. F. N. Pierce exhibited Cidaria minna from Formosa and Assam, also for comparison, C. otregiata, C. suffumata and C. silaceata. Mr. Pierce stated that he had examined the genitalia of these closely allied insects and had found them to be different from each other; it had been suggested that otregiata was identical with minna, but this was not so, besides the differences in the genitalia the wing-markings were distinctly different.

BRITISH MICRO-LEPIDOPTERA.—Mr. Pierce further exhibited a specimen of Oinophila v-tlavum captured in the heart of Liverpool, Cedestis farinatella and Epiblema solandriana var. sinuana from Delamere; Depressaria nervosa from Sales Wood; Eupoecilia alismana (udana) and

Schoenobius forficellus, from Tansor, Northants.

Notes on Coleoptera.—Mr. R. Wilding exhibited and contributed notes upon the following species of Coleoptera, all taken in his garden at Walton, on the outskirts of Liverpool, viz.:—Notiophilus biguttatus, Harpalus aeneus, Pristonychus terricola, Creophilus maxillosus, Philonthus laminatus, P. varians, Telephorus rustica, Agriotes sputator and Coccinella bipunctata: he further showed specimens of Ptinus tectus from the neighbourhood of the Liverpool docks.

March 18th.—Exhibit of genitalia of the whole of the British species of Rhopolagera.—Mr. F. N. Pierce exhibited, by means of the micro-lantern, slides of the genitalia of the whole of the British Rhopalocera, and showed how, in most cases, modern classification of the butterflies was confirmed by a study of the genital armature. Mr. Pierce's remarks were followed by an animated discussion and a hearty vote of thanks was accorded.

Variation in H. Leucophaearia.—Mr. W. A. Tyerman exhibited a long series of *Hibernia leucophaearia* from Eastham, including var. marmorinaria and the black form. It was considered that the melanic

variety was more frequent than formerly in this locality.

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Desiderata.—Eupithecia nanata var. satyrata, for genitalia only, condition immaterial.—E. A. Cockayne, Surgeon, R.N., R.N. Hospital, Haslar, Gosport.

Duplicates.—Euphrosyne, Selene, Blandina, Aegeria, Hyperanthus, Aglaia, Athalia, Davus, T. quercûs, Corydon, Aegon, Asiliformis, P. populi, Mundana, Moneta® (northern form), Geryon, Z. trifolii, Carpini, Obelisca, Orichalcea (fair), Rufina, Lunosa, Pedaria, Ericetaria, Strigillaría, Ulmata, Didymata, Fumata, Muricata (northern), Albulata, Imbutata, many others. Desiderata.—Vespertaria, Apiciaria, Advenaria, Prosapiaria, Dolobraria, Pictaria, Brunneata, Blomeri, Rubricata, Straminata, Subsericeata, Blandiata, Lobulata, Munitata, Quadrifasciaria, Fluviata, and many others. Blackipins only.—James Douglas, Thorncote, Chellaston, nr. Derby.

Duplicates.—*Dissimilis, Velleda, Fibrosa, *Ambigua, Fulva, *Lubricipeda var. Fasciata, *Plantaginis, Coracina, Captiuncula, Mundana, Lutosa, Togata, *Valerianata, Cilialis, Inquinatellus, Caledoniana, Variegana vars. Sauciana, Geminana, Cinerana, Brunnichiana, Schulziana, Congelatella, Occultana, Vectisana, Dorsana, Rusticana, *Suboccelana, *Strobilella, Nanana, Herbosana, Petiverella, T. corticella, *Œcop, Fulvigutella, etc. Desiderata.—Good Pyrales, Tortrices, etc.—T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough.

Duplicates.—East African butterflies wanted, butterflies of any country except species occurring in Britain.—W. Feather, Kibwezi British East Africa.

Desiderata.—Pieris napi—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; Pararge ægeria from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—G. T. Bethune-Baker, 19, Clarendon Road, Edgbaston.

Duplicates.—Machaon*, Sinapis, Edusa, Hyale, Valezina, Artemis*, Cinxia, Athalia, C-album*, Polychloros*, Sibylla*, Cassiope, Blandina, Davus, Betulæ*, Artaxerxes, Arion, Actæon, Galii*, Scoliæformis*, Minos, Exulans, Meliloti, Albulalis, Helveola*, Quadra*, Cribrum, Hera*, Fuliginosa*, Fascelina*, Cratægi*, Callunæ*, Trifolii*, Versicolor*, Lapponaria*, Hispidaria, Glabraria*, Abietaria*, Obfuscata, Trepidaria*, Smaragdaria*, Orbicularia*, Auroria, Fumata, Pictaria*, Alternata*, Carbonaria, Pinetaria, Cæsiata*, Ruficinctata, Salicata, Pygmæata*, Togata*, Sexalisata, Munitata, Fluviata, Lapidata, Undulata, Reticulata, Nubeculosa*, Chaonia*, Or, Flavicornis var. Scotica*, Ridens*, Leporina, Menyanthidis, Myricæ, Concolor, Templi, Agathina*, Conspersa, Barrettii, Occulata*, Tineta*, Glauca, Rectilinea, Peltigera, Melanopa, Cordigera, Interrogationis, Bractea, Craccæ, etc. Desiderata.—Varjeties and local forms.—Arthur Horne, Bonn-na-Coille, Murtle, Aberdeenshire.

Wanted, for research purposes, during 1917, ova and larvæ of almost any species of British Lepidoptera. Offered British beetles (many scarce or local) and microscopic mounts.—Geo. B. Walsh, 166, Bede Burn Road, Jarrow-on-Tyne.

Note.—Mr. Donisthorpe will be grateful for any ants from all parts of the British Isles, with localities, unset or otherwise, for the purposes of study.—H. St. J. K. Donisthorpe, 19, Hazlewell Road, Putney, S.W.

I would be very glad to exchange Californian butterflies for English blues especially the variable \circ s, and the blue \circ s of coridon such as have been recorded by Keynes and others.—Fordyce Grinnell, Jr., 712, East Orange Grove, Paradena, California, U.S.A.

Duplicates.—Artemis* (Cornish), Tithonus extra spotted vars., Corydon var. Semi Syngrapha (fair only), Tiliœ*, Angularia* (Quercinaria), fine banded vars., Bicuspis* and many others, also Pupæ Lacertula, Falcula, Tiliæ, Consortariā, Versicolor, etc. Desiderata.—Perfect only Cardamines & s, Cardui, Iris, Ocellatus, B. quercus, Chlorana, Ligniperda, Humuli, Convolvuli, and many others. Also Pupæ Carpini, Porcellus, Callunæ, Dictæa, Dictæoides, Dodonea, Vinula, S. ligustri, and many others. Liberal exchange or cash.—L. W. Newman, Bexley, Kent.

Desiderata.—Euchloë cardamines from Ireland; also types of E. cardamines from Switzerland, Italy, S. France; var, turritis (S. Italy), var. volgensis, var. thibetana, and of E. gruneri, F. euphenoides, E. damone, and any palearctic species of the genus. Duplicates.—Loweia dorilis and vars., a few minor vars. of R. phiæas (British), and many British lepidoptera.—Harold B. Williams, 82, Filey Avenue, Stoke Newington, N.

MESOFOTAMIA.—I should be glad of information on insects or news of other entomologists in this country.—P. A. Buxton, Fairhill, Tonbridge.

Duplicates.—European butterflies unset on long pins and some set English fashion. Desiderata.—Common British Noetuids.—Hy. J. Turner, 98, Drakefell Road, New Cross, S.E. 14.

Duplicates.—A. coridon vars., including semi-syngrapha, H. Comma. Desiderata.—A. coridon var. Albicans (Spanish) and var. Hispana (do.), and good butterfly vars., especially from Ireland.—Douglas H. Pearson, Chilwell House, Chilwell, Notts.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1918, October 2nd; 16th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—Meetings: The second and fourth Thursdays in the month at 7 o'clock.—Hon. Sec., Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. *Hon. Sec.*, J. Ross, 18, Queens Grove Road, Chingford, N.E.

Toynbee Natural History Society.—Toynbee Hall, at 8 p.m. Entrance fee ls., annual subscription ls. *Meetings*: Full particulars as to excursions can be obtained from the Excursion Secretary, Miss L. Roberts, 11, St. James,' Hatcham, S.E. Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in each month from October to April.—Hon. Sec., Wm. Mansbridge, 4, Norwich Road, Wavertree, Liverpool.

East London Natural History Society.—Bromley Public Hall, E. Thursdays at 8 p.m.—Hon. Sec., J. C. W. Shears, 58, Selborne Road, Ilford.

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Communications have been received or have been promised from Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. P. Pickett, Parkinson Curtis, H. Donisthorpe, A. Sich, Dr. Verity, C. W. Colthrup, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Capt. Burr, G. T. Bethune-Baker, E. B. Ashby, P. A. H. Muschamp, J. H. Durrant, Orazio Querci, Capt. P. P. Graves, Rev. F. D. Morice, D. H. Pearson, etc., with Reports of Societies and Reviews.

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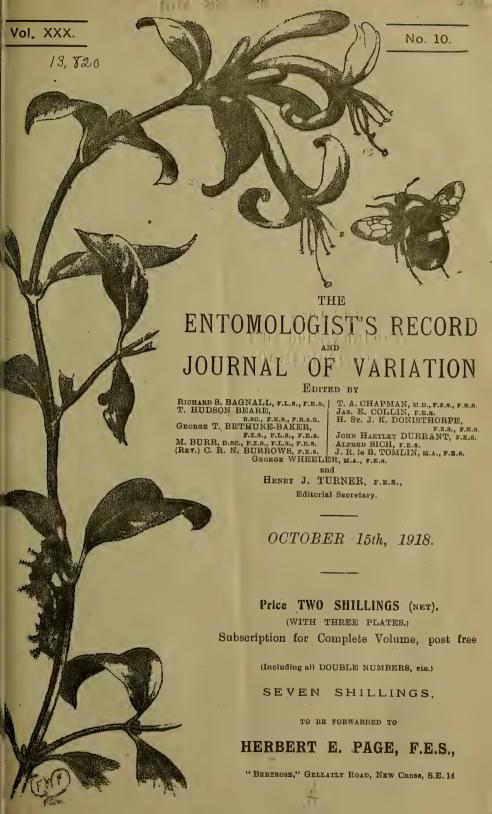
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The Genus Hesperia. (With three plates.) By T. A. CHAPMAN, M.D., F.R.S.

(Continued from p. 145.)

Nearest to the cacaliae group which we have just been considering comes the alreus group of Dr. Reverdin, which he places first of the groups into which he divides the genus. It is characterised as distinguished from the cacaliae group by the possession of "lateral apophyses" to the 10th segment. In this respect it is not easily distinguishable from the malvae group. Dr. Reverdin's alveus group is divided by him into five sections, according to the author who described the species; convenient no doubt from a literary standpoint. The more natural grouping, however, is into the alveus group proper, characterised by the great expansion of the end of the valve (cuiller) which no other group in the genus shows, and the serratulae group with this structure of more ordinary development. The malvae group is very close to, perhaps hardly separable from, the serratulae group. Cynarae is somewhat intermediate, the spoon (cuiller) being more than usually developed, but hardly approaching the dimensions of the alveus group proper. The serratulae group consists of serratulae, Rbr., carlinae, Rbr., fritillum, Schiff. (cirsii, Rbr.), and onopordi, Rbr.

These species may be readily distinguished by the lateral apophyses of the 10th abdominal segment (in the 3). 1. Serratulae has the extremity of these somewhat rounded and covered with spines, not unlike a hedgehog. 2 and 3. Carlinae and fritillum are very much alike. Carlinae has the spinous end of irregular form, rather slender, and the spines few and irregular in size. Fritillum (cirsii) has this portion broader, usually the ventral margin is straight and without spines, the dorsal margin is curved and has a regular row of spines, often finely graduated in size from the largest at the end, the smallest at the base. These details are well seen in pl. xi., where figs. 2 and 3 are very typical of fritillum, the lateral view of the apophyses in these having an outline very like the sole of a foot with a series of toes. Fig. 1 shows a similar form, but looking rather like a hand than a foot. Figs. 5 and 6 of carlinae show its more irregular structure, with a spine on the inner margin. In both species there is a good deal of variation, but each retains its own characteristics sufficiently not to be mistaken for the other. The ædeagus is also wider in carlinae, and there are other slight differences. 4. The fourth species is onopordi, which has two spined processes on the apophysis.

In the Bulletin of the Geneva Society, vol. ii., p. 159, Dr. Reverdin gives in detail the characters of these species, apart from the appendages.

Dr. Reverdin's brief diagnosis of serratulae notes the uniformity of the ground colour beneath, the spots well-defined, but without any border and not at all pearly. Specimens of serratulae may easily be confounded with small carthami, but the latter has the ground colour not uniform, and the spots have slight borders of darker tint.

It seems to be spread over the greater part of Europe, but not very far north; it inhabits high and low levels. I have taken it at Le

Lautaret, and have specimens from Cettinje, the Lebanon, etc.

To what species are we to attach the name fritillum? Dr. Reverdin calls attention to the fact that Schiffermüller first used the name, and referred to a figure by Roesel (Tome 1, Tab. 10, Fig. 7). Roesel's Остовек 15тн, 1918.

figure is unmistakably what we (I, at least) have called *cirsii*, large, with large spots on black colouring, and discal spot square, underside warm red-brown.

This would give the name to *cirsii*, which in fact Dr. Reverdin does, but on the authority of Hübner's figure (464-465).

Whatever Hübner's *fritillum* may be, the name is pre-occupied by Schiffermüller for *cirsii*, Rbr.

As to what species the name fritillum of Hübner belongs has been variously answered. I cannot myself see any reason to doubt that his figure is one of malvae (or malvoides). The only point to the contrary is that the size is unusual; Hübner's figure expands 2mm. more than my largest specimen of the species, but this further two millimetres is not beyond what we know in unusually large specimens of many species. To take the markings in detail, the white dashes above the discal spot on the forewing are precisely as in malrae, and unlike the bold wedge-shaped mark on cirsii. The underside is even more characteristic. The colour and tone of the underwing is the brown and yellow of malvae, not the warm pink tone of cirsii, the outlining of the veins is precisely as in malvae, some outlining of veins can be detected in cirsii, but it wants looking for and is not of so different a colour to the rest of the wing as in malvae. The ochreous margin shown does not occur in either species, but it brings out strongly the general colour effect of malvae, in which it differs so markedly from cirsii. Then again the white spot near the apex of the wing is, as in Hübner's figure, always conspicuous in malrae, but is almost always minute or even wanting in cirsii.

Hübner's alveolus, 466-467, has the wing form and upperside markings of sao, but the underside is difficult to assign to anything but

malvae. 471-472. Sao is no doubt sao as we accept it.

There can be little doubt that Rambur's fritillum is malvoides. He calls it fritillum, Hübner, thus my determination of that figure agrees with his. It is very interesting to note that Rambur, and possibly Hübner, thus discriminated between malvae and malvoides, so long before the re-discovery was made by Elwes and Edwards. The name fritillum would of course have stood for malvoides but for being already preoccupied for cirsii, Rbr., by Schiffermüller.

Dr. Reverdin accepts fritillum, Rbr., as the name of malvoides in his valuable monograph on that species and malvae in the Bulletin de

la Société lépidoptérologique de Genève, vol. ii., p. 59.

Fritillum and carlinae being species whose distinctness from each other is perhaps more open to doubt than in some other cases, it may be useful to refer more in detail to them. I have already mentioned the difference in the appendages, which point to specific distinctness with some approach to certainty. I must admit, however, that I still entertain a little doubt about them. I have something over 300 specimens of the two species, and have mounted in the last ten years the appendages of about 60. Of these 300 I have separated about 80 that are certainly fritillum according to the criteria given by Dr. Reverdin.

The fritillum are large, up to 33mm, have very large conspicuous white spots above, which impresses one with the idea that the black is blacker than in the carlinae series, and perhaps on the whole this is so, as a good many carlinae are not so black. They have the square discal spot, called by Dr. Reverdin the "Signe de Delahaye." Beneath

they are of a warm tint, sometimes almost pink, and they are without the "Signe du rectangle allongé," which Dr. Reverdin calls attention to as marking carlinae. These fritillum are all from southern and low level habitats, Spain, Italy, Digne, Clelles, Beauvezer, Fontaine-bleau.

The carlinae are smaller, down to 26mm. They are greyer, have much smaller spots, have a curved outer margin to the discal spot, and have on the hind wing beneath Reverdin's "signe du rectangle allongé." Further, in the mass the two groups look very distinctly different. The carlinae are from more elevated and more northern localities, various higher regions in Switzerland, La Grave, Pré St. Didier, Cogne, Abriès, Allos, Au Pra, Lautaret, Larche.

But there are a few specimens not quite easily allocated with certainty to one group or the other. Some of the *fritillum* have the curved margin to the discal spot, and some of the *carlinae* have the "elongated rectangle" hardly developed at all. The photograph of the underside on Plate xii. is of a specimen in which this rectangle is rather short, but this is rare, and the *fritillum* never have it so marked

as in typical carlinae.

Fritillum is figured, with Mr. Culot's usual accuracy, in quite typical form in the Études de Lépidoptérologie comparée, Fasc. vi., pl. cxli., figs. 1277 to 1280, and the following four figures are nearly as typical, the first from Saint Zacharie, the latter from Digne. The next four figures, 1285 to 1288, from the neigbourhood of Paris, are similar to those I have from Clelles, which are smaller than the more typical forms (1277 to 1280) and show a definite amount of the "elongated rectangle," making in fact a definite step towards carlinae, and supporting the view that some further localities might give specimens quite bridging over the remaining space. As regards this, it may be said about the "lateral apophyses" of the male appendages, that they are not exactly alike in any two specimens of either species, so that the view that they are not essentially different, but only more or less well-developed according to the size and vigour of the individual insect is suggested.

In Fasciculus iv., pl. lix., figs. 449 to 454, are again excellent figures of cirsii, that have some trace of the "rectangle." These are all from Vernet les Bains, fig. 455, from the same locality, is very near to Hübner's figure of fritillum, and like it, might very well be malvoides rather than cirsii. At p. 389, M. Oberthür discusses this figure, says it is very like malvae, and is rather embarrasing, but decides it is fritillum Hb. With this determination I agree, regarding fritillum of Hübner to be really malvoides. On pl. lvi. in the same Fascicule (iv.), there are two figures of ballotae (Boisd.) that seem to be carlinae; then six figures of carlinae, which seem to be fairly typical of that form, followed by seven given as cirsii. Figs. 505 and 508 rather suggest carlinae and the others suggest a certain approach to that form beyond what is usual in cirsii: taking the localities into account they, probably, however, are all correctly referred to cirsii, but leave the impression that the view that the two are one species is rather supported.

Though it might be contended that we have here an upland and a lowland race of one species, I conclude that they are with hardly any doubt two good and definite species, though closely allied. Were

they one species intermediate forms ought to be frequent; they hardly occur, if at all; a doubtful specimen being always easily located if the appendages be examined, as though these sometimes are also not too decisive, this has never occurred in any specimen of mine in which doubts otherwise arose.

This may be as good a point as any other, to remark on the curious circumstance that we have in the genus Hesperia, at least three instances of two species being very closely related and only recently, indeed, definitely distinguished from each other, in which one of the two species is northern and upland the other southern and lowland. Fritillum and carlinae are one of these pairs, alveus and armoricanus form another, and malvae and malvoides are the third. In the latter case, there is difficulty in always deciding to which species a specimen belongs, yet the structure of the appendages is so different in the two species as to make one doubt whether they are as nearly related as their superficial resemblance suggests, and whether perhaps mimicry may not be a large element in the approach of the two species, that they occupy different areas does not negative this possibility, as though the species do not overlap in their habitats, their probable enemies no doubt cover the area of both species.

Onopordi is a comparatively small species, a large specimen is 34mm., a small one 28mm., 30-32mm, is about the usual expanse,

In some respects it much resembles fritillum, especially in the warm colour of the underside, which is, however, more brown and less pink. Its most distinctive character is in the median pale band beneath the hindwing. In most Hesperias this is a series of spcts, often more or less run together but rarely entirely so; in onopordi it is continuous, or if apparently broken it is not divided into distinct spots, but the spots fade into the intermediate space across which a pale slender line This is especially noticeable as regards the inner spot, which on its outer margin is distinctly outlined in fritillum, serratulae, carlinae, carthami, etc., as a definite rounded spot on its anterior margin; in one pordi the outer margin extends outwards, and remaining distinct or slightly obscured extends costad to the large median spot. This large spot has an extension basewards at its costal side, and on each side has a similar extension towards the hind margin, the costal one being most pronounced. These processes occur in other species, but in one pordi they usually are all three fairly well pronounced, which is rare in any other species, but occurs in carlinae and fritillum.

There is also a special form of the inner spot of the median band, which is hollowed basally sometimes so much as to divide this margin into a fork, the inner prong usually shorter, the distal margin prolonged, sometimes to a sharp point in the middle of this margin, sometimes the prolongation is rounded and nearer the inner margin.

Onopordi is a comparatively southern species. My specimens came from France, Italy, Spain, Algeria and Bosnia. Most of my own collecting are from Southern France. The most northern localities are Allos, Bourg St. Maurice, Susa, Bobbie, Brides les Bains, Prè St. Didier, Neu Spondinig (Stelvio 2,885 ft.).

The distinctive characters of these four species, with alveus and

carthami added for comparison are as follows:—

Alveus.—H.W. underside, inner border of median band almost always straight. Basal spot and band united along anterior border.

Carlinae.—H.W. underside, band straighter than in alveus, but

borders usually irregular, colour rarely olive as in *alveus*, often more or less reddish. "Rectangle allongé" in the space 4-5 and a brown spot between it and median band. The "rectangle" is the marginal spot in this space, and extends squarely towards the middle of the wing as in no other of these species.

Fritillum.—H.W. underside, colour reddish and marbled with darker; rectangle quite short. Upper side, spots large, conspicuously white on a black ground, discoidal spot large and square, in carlinge

it is smaller and has concave margin ("signe de Delahaye").

Onopordi.—H.W. underside, largest spot of band, space 4-5 anvilshaped, inner and outer margins concave; spot in space 1-c ("signe de Blachier"), may be sharply pointed (at inner side of middle of space) towards hind margin and hollowed basally, or the inner margin is further from the base than the outer, giving the basal and outer margins an S curve. It tends to have the spots outlined.

Serratulae.—Discal spot concave outwards, larger than in alveus, onopordi, and carlinae, sometimes nearly as large as in fritillum. H.W. underside ground colour of uniform tint, no marbling or dark margin

to spots.

Carthami.—H.W. underside, colour much as in serratulae, but with much dark shading and with margins to spots, which makes very pronounced the arrow-head form of the marginal spots, especially near 4 and 5.

Dr. Reverdin gives a resumé (p. 171, Bulletin, Geneva Society, vol. ii.) of the characters of these species and (p. 172) of the principal details in the differential diagnosis.

DESCRIPTION OF PLATES.

PLATE X .- MALE APPENDAGES.

Fig. 1. Onopordi. \times 20.

Fig. 2. ,, lateral apophyses. \times 30.

Fig. 3. Serratulae. × 20.

Fig. 4. ,, lateral apophyses. \times 30.

PLATE XI .- MALE APPENDAGES.

Figs. 1 and 3. Fritillum. \times 15.

Fig. 2. , 10th segment. \times 30. Fig. 4. carthami 10th segment. \times 30.

Showing that no "lateral apophyses" are present.

Fig. 5. carlinae. × 15.

Fig. 6. , 10th segment. \times 30.

PLATE XII.—UNDERSIDES × 2 OF

1. serratulae. 2. onopordi. 3. carlinae. 4. fritillum.

These are all very characteristic examples except 3, carlinae, in which the "long rectangle" (against hindmargin, hindwing) is of only about half its usual length in this species, showing how even this character can vary. The specimen was verified by examination of the appendages.

A List of Ants from Mesopotamia; with a description of a new species and a new variety.

By H. DONISTHORPE, F.Z.S., F.E.S.

Nearly all the following Formicidae were taken by Lieutenant W. Edgar Evans, R.A.M.C. (T.), at Amara, on the Tigris, Mesopotamia, a few of each species having been sent to me to name by his father,

Mr. William Evans, of Edinburgh. One species and one variety are new to science.

> Subfamily DORYLINAE Leach. Section EUDORYLINAE Forel.

Tribe DORYLINI Forel. Dorylus Fabricius. Genus Subgenus Typhlopone Westwood.

D. fulvus West. 1 σ sent to me by Lieutenant Buxton, taken at Kumait, R. Tigris; 7 χ taken by Lieut. Evans under clods of earth in cultivated ground near Amara. 10. ii. 18. (No. 9).

> Subfamily MYRMICINAE Mayr. Section EUMYRMICINAE Emery. PHEIDOLINI Emery. Tribe Messor Forel.

. M. barbarus structor Latr., var. orientalis Emery. 10 & in moist ditches in garden, 1. xi. 17. (No. 1), and 1 dealated 2 under clod in garden, near Amara, 12. ii. 18. (No. 10), Lieut. Evans.

> Genus Pheidole Westwood. Subgenus Pheidole Westwood, s. str.

P. pallidula Nyl. 15 (44 and \$\delta\$) under clod on cultivated land, Amara. 9. ii. 18. (No. 14), Lieut. Evans.

> Tribe Solenopsidini Forel. Subtribe Monomoriini Emery. Genus Monomorium Mayr. Subgenus Xeromyrmex Emery.

M. salomonis subopacum F. Sm., var. phoenicia Emery. About 70 ¥ ¥ under clods of earth in cultivated ground near Amara, 10. ii. 18. (No. 7), Lieut. Evans.

Subgenus Paraholcomyrmex Emery.

M. destructor Jerd., var. pallidus n. var. Differs from the typical form, in that the whole body is almost entirely of a pale, but clear bright, yellow. As all the specimens are coloured exactly alike, it is as well to give a name to this variety.

About 90 \$ \$ under clods of earth in cultivated ground near

Amara. 10. ii. 18. (No. 5), Lieut. Evans.

Subgenus Holcomyrmex Mayr.

M. evansi n. sp.

§ Shining brownish black, with long scattered white hairs; mandibles, cheeks,

tarsi, and articulations of the joints of the legs brown-yellow.

Head rectangular, finely and sparingly punctured; clypeus smooth and shining, furnished with two strong, sharp, projecting points; mandibles striate, terminal border armed with three strong teeth; antennæ 12-jointed, club 3-jointed, shorter than the rest of the funiculus. Thorax very finely and sparingly punctured; sides of mesonotum finely granulate; epinotum almost impunctate. Petiole almost impunctate, cylindrical and long anteriorly, the post-petiole broad and nodiform posteriorly; gaster very finely punctured. Long, 4mm.

? Head, thorax, petiole, and post-petiole almost black, mandibles, tarşi, articulations of the joints of the legs, and gaster, brown.

Very much larger, more strongly punctured, and more hairy than &. Petiole and post petiole broader in proportion than in y. Wings ample, milky white, pterostigma, costa, and subcosta, brown. Long, 11-12mm.

3 Black, with long light brown hairs; tarsi, articulations of the joints of legs,

and gaster, brown.

Head subrectangular, punctate and striate; clypeus broad and convex; mandibles strong, striate, terminal border armed with two sharp teeth; antenne 13-jointed, funiculus slightly thickened towards apex. Thorax high; mesonotum longitudinally striate, with scattered, pit-like punctures with raised edges; praescutellum longitudinally striate; scutellum shining, with scattered punctures with raised edges; epinotum striate and finely rugose. Petiole and post petiole broad, finely transversely striate on upper surface; gaster with finely scattered punctures. Wings as in 2. Long, 9.5mm.

This species is allied to M. (H.) dentigerum Rog., from which it differs in being larger and darker in colour, the teeth of the clypeus are stronger and sharper, and the petiole and post petiole are larger and

much broader, etc.

Subfamily **DOLICHODERINAE** Forel. Section EUDOLICHODERINAE Forel.

Tribe Tapinomini Emery.
Genus Tapinoma Foerster.
Subgenus Tapinoma Foerster s. str.

T. melanocephalum F. Two dealated 9 9 and 50 \$ \$ under stones in garden below Amara, 18. iii. 18. (No. 15), Lieut. Evans.

Subfamily CAMPONOTINAE Forel.

Section MESOCAMPONOTINAE Forel.

Tribe Plagiolepidini Forel. Genus Acantholepis Forel.

A. frauenfeldi Mayr. Seven deälated \circ \circ and \circ \circ under clod in garden near Amara, 13. ii. 18. (No. 12), Lieut. Evans.

Genus Plagiolepis Mayr. Subgenus Plagiolepis Mayr. s. str.

P. pygmaea Latr. Four & & under clod in cultivated land near Amara, 19. ii. 18. (No. 13), Lieut. Evans. & & sent to Dr. Chapman by Lieut. Buxton from Mesopotamia, attending Lycaenid larve.

Section EUCAMPONOTINI Forel.

Tribe Prenolepidini Forel.
Genus Prenolepis Mayr.
Subgenus Nylanderia Emery.

P. longicornis Latr. Thirty & & in room in A.D.M.S. billets, Amara, 24. xi. 17. (No. 3), Lieut. Evans.

P. jaegerskjoeldi Mayr. Thirty-nine & & under clods of earth in cultivated ground near Amara, 10. ii. 18. (No. 4), Lieut. Evans.

Tribe Camponotini Forel. Genus Camponotus Mayr. Subgenus Myrmoturba Forel.

C. maculatus thoracicus Forel., var. xerxes Forel. Eight (44 and \$\infty\$) on verandah of A.D.M.S. billets, Amara, 10. xi. 17. (No. 2), five \$\infty\$ under clods of earth in cultivated ground near Amara, 10. ii. 18. (No. 8), and one \$\infty\$ and fourteen (44 and \$\infty\$) under clods in garden near Amara, 12. ii. 18. (No. 11), Lieut. Evans.

N.B.—The numbers in brackets refer to the numbers on the packets sent to me by Mr. Evans.

Racial and Subspecific Names.

By T. A. CHAPMAN, M.D., F.E.S.

Mr. Wheeler (Ent. Rec., vol. xxx., p. 145) brings against me a friendly accusation of reasoning in the most unsound way he can imagine. This might be simply answered by observing that he heads his protest "Varietal and Aberrational Nomenclature." My statement had no reference to varietal and aberrational nomenclature at all, but was an attempt to specify a point or two bearing on whether a form was or was not a subspecies.

One has to use words that are not definitely accepted by every one in the same sense. For present purposes I use "race" or "subspecies" for the inhabitants of two different areas, if they can be distinguished, and assert that such two "races" or "subspecies" can only conveniently be discussed by giving them names. The race inhabiting the locality from which the type of the species comes, retains the type name, which is also that of any race indistinguishable from it.

A "variety" is a form occurring with the type race, or any where else, in fair numbers suggesting that it is usual for the species to vary in this way. An "aberration" differs from a variety in being comparatively rare and unusual, and suggestive of probably having a pathological cause. The line of demarcation between "variety" and "aberration" may not always be easy to draw. I wish distinctly to object to the word "variety" being used as synonymous with "race" or "subspecies." Any race of a species may present many varieties and many aberrations, but the names of these varieties and aberrations would be the same wherever they occurred.

This, I think, explains my attitude, though it might be obscured by my trying too briefly to express such parts of it as referred to

Coccinella 11 punctata subsp. boreoliteralis.

I incline to think that Mr. Wheeler's extraordinary misapprehension of my views is due to his using the word "variety" (var.) as equivalent to "race" or "subspecies," and he uses "aberration" (ab.) in the sense in which I use "variety." His usage is consonant with

that of Staudinger.

Mr. Wheeler appears to have misunderstood what I intended to convey. To suggest that it would result in an increase of varietal and aberrational names is a gratuitous inversion of my meaning. I should certainly like to see the torrent of varietal and aberrational names stemmed. One cannot help fearing that they often arise from commercial motives and even sometimes a little personal vanity.

I desire to extend somewhat further than they do, the recognition of subspecies or races that Lord Rothschild and Dr. Jordan have shown us to be necessary. They postulate, if I recollect aright, that subspecies (or geographical races) should be completely segregated from the other branches of the species in some geographical way.

I think a subspecies is a subspecies whether its geographical separation be complete or not, even if there be no very stringent separation at all. Of course, geographical separation is almost con-

clusive proof that the separated race is a subspecies, and if this be so, then it seems unnecessary to find any varietal differences, though as a matter of fact, such differences practically always exist where races are so separated. The real proof that geographical races are subspecies, or that any two different races of a species are subspecies, is not to be found in their segregation, or in the amount of their differences, but in the circumstance, that these differences have a permanence under any disturbance as of habitat, etc., that makes some approach to the permanence under such disturbance of a species. That this can rarely be ascertained makes it necessary that we should observe a doubtful attitude in most cases, admitting that we are unable to decide in either way, unless so strong a fact as geographical separation obtains.

To understand the nature and causes of such local races, to find out whether they be subspecies or no, *i.e.*, whether under disturbance they retain their racial characteristics, or in a limited time revert to some other ordinary form of the species, is at least as important a question as any relating to varieties, and consequently if they have to be discussed in any case, the necessity of recognising them without a description, which Mr. Wheeler accepts as the criterion of the neces-

sity for a name, is at least as great as in the case of varieties.

Mr. Wheeler's contemptuous reference to the numbers and proportions of different forms in any race must arise from not understanding my statement. I don't want to meddle with varietal or aberrational names in any way, but I again assert that two races of a species differ in a subspecific manner and possibly (until it is proved or disproved by experiment) to a subspecific extent, even if the only difference between them is that the varieties of which they are composed occur in decidedly different proportions in the two races. A composite photograph of either race would differ appreciably from that of the other.

The diagram (and corresponding text) in Rothschild's and Jordan's Sphingidae, p. xxxv., precisely asserts my proposition in pointing out that subspecies may differ from each other merely in the proportions of the varieties of which they consist, which I take it is, nevertheless, the item of unsound reason that is beyond Mr. Wheeler's imagination. In passing, I may note that they drop any very definite use of the word "variety," making it cover all variation. They use "subspecies" in the sense I adopt, and form for what I call a variety.

There is much to be said for this attitude, considering the am-

biguity that varied usage has attached to the word "variety.'

Syngrapha, to take one of Mr. Wheeler's illustrations, is practically absent in most races of coridon, an aberration in many, in the Charente Inférieure it is a very predominant variety. This race, therefore, deserves a name, but the name syngrapha is not interfered with in any

way.

The racial name includes both varietal and non-varietal forms of the race, but does not interfere with the varietal names. The illustration drawn from Lycaena arion by Mr. Wheeler may serve to explain the position. I know something of the life-history of L. arion, but of its subspecies, varieties, and aberrations, I know very little, therefore I deal with the matter somewhat hypothetically. Mr. Wheeler mentions ligarica as a racial form, i.e., as a subspecies, but he implies also that it is the name of what I call a variety. If ligarica is a subspecies,

that name covers the dominant variety and any variations and aberrations therefrom. Are we to say that the variety (aberration, Wh.) ligurica is the most abundant form in the subspecies ligurica? It may be convenient to leave it at that, till we have to discuss the matter with scientific accuracy, then we must have a name for the race different from that of the variety of which it largely consists. The type form may be a variety (aberration?) of the race ligurica, but when it so occurs, its racial name is none the less ligurica. It should be observed, however, that the type aberration here is an aberration of the race ligurica and not of the variety (aberration) ligurica.

We should have

L. arion subsp. ligurica var. ligurica.

In the first line of which ligarica is used in two senses, which cannot be defended.

I think Rothschild and Jordan fell into this error.

My whole point is to claim for races of species a really more important position than varieties are entitled to. The chief interest of varieties and aberrations (beyond the commercial and collector's view)

is that they are valuable data in the study of races.

[I am sorry to have misunderstood Dr. Chapman's meaning, but my "misapprehension" cannot be justly described as "extraordinary," since every entomologist with whom I have had any conversation on the subject understood Dr. Chapman's remarks in exactly the same way as I did. I certainly use "variety" (when I use the word at all) as the exact equivalent of "local race," as I believe almost everyone else does; at any rate the practice is so usual that anyone using the word in any other sense cannot expect to be understood unless he clearly defines the sense in which he uses it. It would no doubt be a clear gain if everyone would agree to use the word in Dr. Chapman's sense, for it expresses something for which we have at present no recognised formula, but I fear such use of the word could now only promote further misunderstandings. The "unsound reasoning" of which I complained was the apparent statement that the same name could not be used for a variety (local race) and an aberration, when as a matter of fact the same form constantly occurs in both characters. With regard to the practical inconveniences arising from Dr. Chapman's present explanation, I can only say that as far as I see at present, they seem to be almost as great as they would have been if he had meant what I supposed. I will try to work this out in detail later, the process is too long for a mere note.—George Wheeler.]

A Fortnight in the New Forest in July. By H. DONISTHORPE, F.Z.S., F.E.S.

On July 16th I went down to the New Forest for a much-needed rest and change, putting up at the Beaulieu Road Hotel, where I stayed until the 31st. Although on the whole the weather was bad, only one day was too wet to go out at all, and I much enjoyed being in the Forest once more; not having been there since July, 1914. Not being strong enough for much strenuous collecting, I took things very quietly, not straying far afield, though I managed to lose myself twice, a thing I had not done in all the years I have been to the Forest,

since my first visit in 1891. A great part of my time was spent in quietly observing ants' nests; the results of these investigations, however, I hope to publish shortly in my "Myrmecophilous Notes for 1918." It was a great pleasure to see so many butterflies about; the White Admiral (Limenitis sibilla) and the Silver-washed Fritillary (Drugs paphia and var. valesing) occurring in the utmost profusion in all the glades, etc., flying about and settling on flowers of bramble. met a lepidopterist (who being a middle-aged man like myself, was waiting to be called up for his Medical Board for the Army, a pleasure in store, which I had already experienced) who showed me several specimens of paphia with confluent marks, a rare form, which I subsequently saw, but was unable to catch with my heavy sweeping net. Many couples of paphia were observed in cop., and both the 3 and 2 were seen to carry the other in flight; a fact, however, which is probably well known. The Large Tortoise-shell (Euvanessa polychloros) was noted on several occasions near the hotel; its larvæ, I am told, feed up on a sallow tree in the hotel garden. One very small specimen of the Small Tortoiseshell (Aglais urticae) was taken on the road; and I made great efforts to catch a Small Copper (Rumicia phlaeas) which had the right hindwing entirely white; but failed to do so. A number of large Psychid cases occurred in the hotel garden, fastened to the fences round the same. A pair of the moth Mamestra brassicae, in cop., was noted on the wall of the bridge; they were situated back to back, their colour, not quite normal, exactly matching the lichencovered stone-work.

A few Diptera were taken; Miltogramma conica in a sand pit; the large Echinomyia grossa, which is parasitic on the "Fox Moth" caterpillar, was not uncommon on bracken, etc.; a nice specimen of Alophora hemiptera v. obscura, with the wings very dark (Collin tells me this is the darkest form he has seen), was captured on a mossy tree trunk; and a very large Tabanus (T. bovinus) was picked up on the

road, alive but apparently stupified.

Some of the Hymenoptera, not including the ants, may be mentioned: - ? ? of Mutilla europea and Myrmosa melanocephala were found in a sand-pit, a favourite collecting ground of former years (I had caused a shallow trench to be dug all round beneath the overhanging bank, a fact which did not meet with the approval of the woodman who dwelt near by; however, all's well that ends well!). Just near this spot I took a female of the Mutilla in 1914 running over half-a-crown, and other silver coins amounting in all to 7/6 were lying beneath the 2/6; a curious find in a place like the Forest! following Bees, Fossors, and Sawflies were taken by me for my friend, the Rev. F. D. Morice: Halictus prasinus, Ephecodes pilifrons, Dasypoda hirtipes, Anthophora 4-maculata, Epcolus rujipes, Nomada obtusifrons and Panurgus calcaratus; Pompilus spinus, P. rufipes, Ammophila campestris and Mellinus arvensis: Pteronidea pavida, Tenthredella livida and T. balteata. Other Hymenoptera captured with their prey were— Crabro peltarius with a fly; C. christosoma, dug out of alder with its burrows filled with a Syrphid fly; several Pompilus plumbeus with the spider Eusperys erraticus; and Agenia variegata dragging a spider (Segestria sp.) along on a felled tree.

A 3 of the common cockroach (Periplaneta orientalis) was found under bark of oak in an enclosure far away from any houses or dwell-

ings of any sort. Most of the trees in this enclosure had been felled, so I suspect the insect had been introduced in stores, or something, when the Canadian Forestry Corps was camping near by. I must say that the felling of trees has been done very well, and very little damage, if any, has been caused. The trees cut down being mostly Scots Firs; none of the fine old oaks or beeches being touched at all. My cousin, Major H. Donisthorpe, who is now in France with the Canadian Foresters, had given me an introduction to the officers in the Forest, should I run across any of them in my rambles; but I did not do so.

One was continually reminded of the War by the sight and sound of aeroplanes flying all over parts of the Forest. A large camp of airmen was situated at Beaulieu, and one captain and two lieutenants from this camp were killed during my short stay. One poor fellow came down quite close to the hotel; his aeroplane being smashed to

bits.

The following Coleoptera were taken, or noticed, many of which. of course are quite common or uninteresting:—Cicindela campestris L.; Cychrus rostratus L., in sand-pit; Carabus catenulatus Scop.; C. granulatus L.; C. nemoralis Müll; C. monilis F.; C. arvensis Hbst., and C. violaceus F., in sand-pit; Notiophilus, a black specimen, which Blair and I make out to be N. pusillus Wat., at roots of grass; Harpalus honestus and Pterostichus lepidus F., not uncommon in the sandpit (one specimen being entirely black), also found on heaths; P. oblongo-punctatus F., under chips of wood; Abax striola F.; Amara patricia Duft., a nice specimen in sand-pit; Olistophus rotundatus Pk., sand-pit; Rhantus n. sp., in a puddle of water on the path; this is a very curious specimen, it is entirely black beneath, but it certainly is not pulverosus, being smaller and the puncturation quite different, the antennae are dark, ringed with yellow at the base of the joints, the head is quite black, the thorax and elytra are dark with only the side borders yellowish. I can find nothing like it in the Museum, nor in descriptions. I have told Dr. Sharp the locality and trust further specimens may be found in the ditches near by; I had no water-net with me at the time. Paracymus nigroaeneus F., common in pools of water in a sand-pit in company with Hydrochus angustatus Germ., Hydraena testacea Curt., etc.; Helophorus aeneipennis Th., in numbers in a small depression in a large felled tree, full of water; Aleochara fumata Gr., in fungi; Oxypoda vittata Märk., with Dendrolasius fuliginosus; Atemeles paradoxus Gr., three specimens with Formica fusca v. qlebaria, a new record for the Forest; Thamiaraea cinnamomea Gr., at Cossus tree; Homalota liturata Steph., with D. fuliginosus; Homalota divisa Märk., in sand-pit; Gyrophaena gentilis Er., and G. affinis Sahlb., in fungi; Mycetoporus brunneus Marsh., and M. clavicornis Steph., in sand-pit: Epipeda plana Gyll., Ischnoglossa prolixa Gr., under bark; Ocyusa incrassata Muls., in sandpit; Quedius lateralis Gr. under bark; Staphylinus stercorarius Ol., with Tetramorium caespitum; S. erythropterus L., in bog; Philonthus splendidulus Gr., under bark; Anthobium ophthalmicum Marsh., beating chestnut blossoms; Phloeocharis subtilissima Man., under bark; Agathidium seminulum L., and Liodes humeralis Kug., under bark; Silpha atrata L., in sand-pit; Euthia plicata Gyll., with F. rufa; Litargus bifasciatus F., Ditoma crenata F., and Cerylon ferrugineum Steph., under bark; Epuraea obsoleta F., Soronia grisea L., and Ips 4-guttata F., at Cossus tree; Rhizophagus ferrugineus Pk., Laemophloeus ferrugineus Steph., and Triphyllus punctatus F., pale form, under bark; Byrrhus pilula F., B. fasciatus F., very variable series, and B. dorsalis F., in sand pit; Aphodius depressus Kug., sweeping; Geotrupes pyrenaeus Charp., on sandy spot.

near putrid fungi; Serica brunnea L., in sand-pit.

Anomala aenea De G. This beetle occurred in numbers near the sand-pit and I spent many hours observing its habits, and was especially interested in it, as I had never before taken the green or blue forms. It did not appear to come out until after 11 o'clock when specimens might be found on the sand and at the entrance to small holes in a sandy bank with a little moss and turf growing on it. I dug up specimens, and also the larvæ, not very deep in the ground. Later in the day the beetles began to fly briskly in the sunshine. Out of some 50 specimens noted, the majority were all green of various shades, apparently the type (aenea); 5 had deep blue elytra with green head and thorax (=ab. bicolor Torre): of 6 with yellow elytra, 3 had the head and thorax quite green (=ab. frischi F.), and 3 with more or less yellow side borders to the thorax (=ab. tricolor Torre). of the green forms have the elytra slightly bluish. Of the specimens in my collection from Deal, Birkdale and Woking, all have the elytra yellow, those from the two former localities with distinct yellow borders to the thorax, and those from the last-named locality with more or less yellow borders; all would be classified ab. tricolor, I suppose.

Cetonia aurata L., in hotel garden; Elater elongatulus F., in pine stumps; Athous vittatus F., sweeping bracken; Corymbites holosericeus F., on tree; E. sanguinolentus Schr., a cripple, bred from pupa in birch log; Lampyris noctiluca L., flew in to light; Ernobius mollis L., common in summer house in hotel garden; Aromia moschata L., on ragwort; Leptura scutellata F., on road; Strangalia armata Hbst., abundant on bramble blossoms; S. metanura L., sweeping; Leiopus nebulosus L., bred from pupa; Donacia limbata Pz., on reeds; Clythra 4-punctata L., on sallows; Chrysomela didymata Scrib., dark specimen on bridge; Phyllobrotica 4-maculata L., abundant on "skull-cap"; Clinocara undulata Kr., under bark; Phloeotrya rufipes Gyll., in old holly stump; Salpingus ater Pk., under beech bark; Tomoxia biguttata Gyll., on beech tree; Anaspis subtestacea Steph., A. latipalpis Schil., and A. frontalis L., beating chestnut blossoms; Apion fraudator Shp., and A. haematodes Kirb., on Rumen in hotel garden; A. brachypterum Shp., on a fallen bough (teste Dr. Sharp); Strophosomus fulvicornis Walt., sweeping braken; Orthochaetes insignis Aubé, at roots of Rumex acetosella in hotel garden, this species, which was added to the British list in 1912, has not been recorded from the Forest before; Cionus scrophulariae L., C. hortulanus Mull., C. pulchellus Hbst., on Scrophularia nodosa; Cleonus nebulosus L., common in sand-pit; and Trypodendron

OTES ON COLLECTING, Etc.

domesticum L., in dead beech.

Notes on Collecting in 1918.—Except during my holiday from July 8th to August 8th, much of which was spoilt by bad weather, I have only had four days' collecting this year. On May 30th I went to Guildford, walking over the downs from Horsley to Gomshall. At

Horsley Hamearis lucina was fairly common, though not in the abundance in which I have sometimes seen it there; Hesperia malvae and Nisoniades tages were both to be seen in numbers, the latter in considerable variety; Brenthis euphrosyne, Coenonympha pamphilus, Euchloë cardamines and the two smaller Pierids showed up in fair numbers, and two worn specimens of Pararue menera were seen. At Gomshall Agriades thetis was common and in good condition, but though I examined considerable numbers I only found one minor aberration, in which there was an extra small spot inside the central row on the forewings joined by a short streak to the discoidal. On the Hog's Back, at Guildford, on the following day, Pararge megera was common, the only 2 taken being of the ab. mediolugens, which I had never come across before either in England or abroad. Rumicia phlaeas was also common, and I took one very fresh specimen of the brassy aberration intermedia. The three common Pierids, hybernated Gonepteryx rhamni, and a few Polyommatus icarus were to be seen, and in the first field beyond the green road a couple of Cupido minimus were already out.

I had no further opportunity of hunting till July 4th, when I went to Snodland for the chalk form of Plebeius aeyon, the &s of which were abundant, but the ?s only just emerging; Epinephele jurtina, Coenonympha pamphilus, and Argynnis aglaia were the only other species seen; all were common. On July 8th I went to Poundstock, near Bude, for ten days, but we had only one day without rain, though the sun was occasionally hot for an hour or two at a time. Lycaena arion was present on the better days in fair numbers, and there were some specimens in very good condition, though it had begun to emerge in the second week in June. Adopaea flava swarmed, and the first spec mens I saw were so dark and small that I hastily took them for A. lineola, and was proportionately disappointed on discovering my rather inexcusable mistake. The first brood of P. icarus just overlapped the second, as I saw one specimen in the last stage of dilapidation, and one just emerged, on the first day of my visit; the 2nd brood became fairly common just before I left. Melanargia galathea, E. jurtina, C. pamphilus, and Aphantopus hyperantus were common, and a few Dryas paphia and Argynnis aglaia were to be seen, and of the latter I saw a fine dark 2, almost as dark as D. paphia ab. ralesina, but being on the cliff I was unable to secure it. Pieris rapae occasionally appeared and P. nani was common. I was much interested to note the very extended flight-time of certain species; E. jurtina was flying before 7 a.m., and A. hyperantus and P. napi soon after 8 a.m. (Greenwich time), and the two Satyrids continued on the wing till 8 p.m. (G.T.). The cliff fell rapidly to the sea in front of our lodgings, but was quite negotiable with care, and a list of the butterflies which frequented this steep groun I may not be without interest; they were: Agriades sylvanus, Lycaena arion, Pieris rapae (occasionally), P. napi, Dryas paphia (rarely), Argynnis aglaia, Aglais urticae, Coenonympha pamphilus, Aphantopus hyperantus, Epinephele jurtina, Hipparchia semele, and Melanargia galathea. The only moth noticed on the cliff was Lasiocampa quercus, which dashed about wildly, and I also found full-fed larvæ of Cosmotriche potatoria and Saturnia carpini. On the 12th I took one very fresh specimen of Epinephele tithonus, which I was glad to see emerging, as it was the principal object of my next visit, namely, to Tavistock, where we went on the 18th. In the south-west of England, and particularly in this neighbourhood, E. tithonus is remarkable for the

development of extra spots, especially on the forewings, on both sides, and not unusually on the upper side of the hindwing also: these spots may be large or small, blind or pupilled, or on the hindwing the white pupil only may exist; this, together with a considerable range of ground colour and extent of suffusion, gives wide scope for variation. Notwithstanding the fact that we had no single day without rain, I succeeded in obtaining a good series, though many of them were afterwards more or less damaged by an accident to my setting box, caused by curiosity on the part of a youthful domestic, who however—to her honour be it said—owned up instantly and made no effort to palliate her crime! It soon became evident that both E. tithonus and E. jurtina, as well as A. hyperantus were supremely indifferent to sunshine. and flew in quite as large numbers on a sunless day, provided it was warm, as when the sun was shining brightly; indeed many remained on the wing on warm days even when it was raining too much to keep one's net up. These three species and Pieris napi were very abundant throughout my visit, but A. hyperantus was very worn after the first two or three days. I only saw one Hipparchia semele, but the complete absence of Coenonympha pamphilus was far more remarkable, the absence also of Melanargia galathea was unexpected. A few Pararge aegeria appeared in the lane just outside our lodging, on the 24th, but the males were very common in a wood overlooking the Tamar, on the 25th; on the latter day (the last of my stay) P. megera appeared for the first time. Pyrameis cardui was fairly common at the roadsides, as was Aglais urticae, and in one lane I saw several Vanessa io in prime condition, though the nettles in another lane produced larvæ not more than half grown. P. atalanta, not fresh, was in fair numbers on the bramble blossoms. All the species hitherto mentioned, as well as Pieris brassicae and P. rapae, one is accustomed to seeing at the road-sides, and Devonshire lanes and roads offer great attractions to butterflies, but it was something of a surprise to take Dryas paphia in a similar situation at a considerable distance from any wood. Of course where a road borders a wood it is common to find it, but here it was in some numbers with no wood near, though certainly commoner in the wood where I took P. aegeria. E. tithonus here is, like E. jurtina, A. hyperantus and P. napi at Bude, an early riser; numbers were flying about the hedge as I walked down into Tavistock on Sunday morning before 7 a.m. (Greenwich time).

On the 26th we left for Guildford, and on the following day I saw on the Hog's Back, Celastrina argiolus in some numbers, a few Polyommatus icarus, and at the end of the green road a colony of Agriades coridon, the 3s being abundant, but the 2s scarce. This colony appears to be spreading eastwards, as it has advanced considerably nearer to Guildford than I have seen it in former years. The two small Pierids, Gonepteryx rhamni, and A. hyperantus were also common. All these species continued during my week's visit, though A. hyperantus was soon somewhat worn, far less so however than at Tavistock; E. iurtina, which was also common, was quite in rags; P. brassicae appeared on the 24th, and was very fresh, the other two Pierids being in all sorts of conditions, though all, of course, of second brood forms; the other species taken were F. tithonus, a few, 3 s only, 1. megera, second brood, the only 2 seen being somewhat dark-banded, C. pamphilus, Aglais urticae, and Aricia medon, just ap-

pearing; on the 31st I also saw, but failed to take, a specimen of

Euvanessa polychloros.

On August 1st I moved to Bourton-on-the-Water, on the Cotswolds, where I had samples of all sorts of weather. On the 3rd I found *Polygonia c-album* at the top of Bourton Hill; A. urticae was swarming at the roadside and in the neighbouring fields. and the three Pierids were abundant; there were a few P. meyera, and a fair number of A. hyperantus, remnants of E. jurtina, a few Polyommatus icarus, and a single Agriades coridon. On the 6th the latter species was fairly common at the side of the Northleach road. about three-quarters of a mile out of Bourton, which my brother tells me is a new locality for it; at the same place were a few M. galathea. A. hyperantus, P. cardui, and Rumicia phlaeas, swarms of Adopaea flava and a single Aricia medon, very fresh; a little further on, at the other side of the road, were several Vanessa io in splendid condition; A. urticae and the three common Pierids were everywhere and in prime condition. On the 7th I had a day in my earliest hunting ground, Wolford Wood; but except for P. c-album did not meet with much success. I was specially anxious to take Bithys quercus, which was common enough but utterly refused to descend from the tree-tops: I only got one 2, which turned out to be a good deal torn! D. paphia was common but mostly ragged, Argynnis adippe also very worn, except one 9; I'. io was common and remarkably fine, C. pamphilus was but slightly represented, P. icarus entirely absent. The three Pierids were in good condition and common, so also was R. phlaeas, of which I took a nice ab, suffusa and several caeruleo-punctata; but on the whole the expedition was rather disappointing.

The following day I returned home, and my only other expedition was to Prince's Risborough on the 13th, where A. coridon was abundant and variable, but no ab. syngrapha; P. icarus, C. argiolus, and C. pamphilus were common, as were also the three Pierids and worn-out E. jurtina; A. medon was not uncommon, nor were R. phlaeas and A. hyperantus; the only other species seen being a few P. aegeria and E. tithonus, neither of which appeared to be plentiful. The more interesting observations made with regard to paired butterflies in flight, were published separately (pp. 152-3).—George Wheeler.

37, Gloucester Place, W. 1.

The Red Admiral (Pyrameis atalanta) in London.—On September 25th I saw a specimen of this butterfly flying in Dean Street, Soho. It settled on the wall of a house above a shop, where it remained sunning itself for some time. This appears to me to be a curious locality for the insect. Where would it have come from? — Horace Donisthorpe.

CURRENT NOTES AND SHORT NOTICES.

In the Bull. Soc. Vaud. Sc. Nat., vol. 52, p. 155 (1918), Dr. A. Forel names a new variety of Euponera (Hagensia) havilandi, For., from Durban, var. fochi, n.v.—H.J.D.

The numbers due for November and December will possibly be published in early December, together with the completion of the important Supplement and the General Index to the volume. The Back volumes (I-XXIX) of the Ent. Record, &c. (published at 10s. 6d. net), can be obtained direct as follows—Single volumes, 7s. 6d., except vols. I. and II., which are 10s. 6d. each; of the remainder 2 or 3 volumes, 7s. 3d. each; 4, 5, 6, 7, 8 or 9 vols, 7s. each; 10, 11, 12, 13 or 14 vols. at 6s. 9d. each; 15, or more vols. at 6s. 6d. each. Back copies of the Magazine at double the published price (plus postage). Special Indexes to Vols. III-XXIX, sold separately, price 1s. 6d. each.

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Duplicates.—T. pruni (fair types), Pisi (bred), Lucipara (bred), pupæ of Lanestris. Desiderata.—Very numerous to renew and extend.—Wm. Foddy, 39, York Street, Rugby,

Desiderata.—Eupithecia nanata var. satyrata, for genitalia only, condition immaterial.—E. A. Cockayne, Surgeon, R.N., R.N. Hospital, Haslar, Gosport.

Duplicates.—A. cratægi, Athalia, T. rubi, Paniscus, Asiliformís, T. cratægi*, Carpini*, Flammea, Basilinea. Populeti, Lunosa, Interrogationis, Chryson (fair), Pedaria, Punctularia, Angularia*, Liturata and var. Nigrofulvata, Omicromaria*, Fumata, Tristata, Didymata, Saggitata, many others. Desiderata.—Wanted particularly Nigricans, Concolor, Advenaria, Fasciaria, Dolabraria, Bidentata, Lobulata, Fluviata, also to extend, Agathina, Ravida, Simulans, Hispidaria, Scolopacina, Elymi, Vespertaria, Hispidaria, Glabraria, Obfuscaria, Vernaria, Rubricata, Straminata, Pinetaria, Blandiata, Sexalata, Hexapterata, Obliquaria, and others.—James Douglas, Thorncote, Chellaston, nr. Derby.

Duplicates.—*Dissimilis, Velleda, Fibrosa, *Ambigua, Fulva, *Lubricipeda var. Fasciata, *Plantaginis, Coracina, Captiuncula, Mundana, Lutosa, Togata, *Valerianata, Cilialis, Inquinatellus, Caledoniana, Variegana vars. Sauciana, Geminana, Cinerana, Brunnichiana, Schulziana, Congelatella, Occultana, Vectisana, Dorsana, Rusticana, *Suboccelana, *Strobilella, Nanana, Herbosana, Petiverella, T. corticella, *Œcop, Fulvigutella, etc. Desiderata.—Good Pyrales, Tortrices, etc.—T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough.

Duplicates.—East African butterflies wanted, butterflies of any country except species occurring in Britain.—W. Feather, Kibwezi British East Africa.

Desiderata. – Pieris napi—spring and summer broods with exact data (localities and dates)—from all parts of the Kingdom, especially North of England and Scotland; Pararge ægeria from Scotland, Ireland, and North of England—exact data needed. Will do my best in return or pay cash.—G. T. Bethane-Baker, 19, Clarendon Road, Edgbuston.

Duplicates.—Machaon*, Sinapis, Edusa, Hyale, Valezina, Artemis*, Cinxia, Athalia, C-album*, Polychloros*, Sibylla*, Cassiope, Blandina, Davus, Betula*, Artaxerxes, Arion, Actæon, Galii*, Secliæformis*, Minos, Exulans, Meliloti, Albulalis, Helveola*, Quadra*, Cribrum, Hera*, Fuliginosa*, Fascelina*, Cratægi*, Callunæ*, Trifolii*, Versicolor*, Lapponaria*, Hispidaria, Glabraria*, Abietaria*, Obfuscata, Trepidaria*, Smaragdaria*, Orbicularia*, Auroria, Fumata, Pictaria*, Alternata*, Carbonaria, Pinetaria, Cæsiata, Ruficinetata, Salicata, Pygmæata*, Togata*, Sexalisata, Munitata, Fluviata, Lapidata Undulata, Reticulata, Nubeculosa*, Chaonia*, Or, Flavicornis var. Scotica*, Ridens*, Leporina, Menyanthidis, Myrica, Concolor, Templi, Agathina*, Conspersa, Barrettii, Occulata*, Tineta*, Glauca, Rectilinea, Peltigera, Melanopa, Cordigera, Interrogationis, Bractea, Cracco, etc. Desiderata.—Varieties and local forms.—Arthur Horne, Bonn-na-Goille, Martle, Aberdeenshire.

Wanted, for research purposes, during 1917, ova and larvæ of almost any species of British Lepidoptera. Offered British beetles (many scarce or local) and microscopic mounts.—Geo. B. Walsh, 166, Bede Burn Road, Jarrow-on-Tyne.

Note.—Mr. Donisthorpe will be grateful for any ants from all parts of the British Isles, with localities, unset or otherwise, for the purposes of study.—H. St. J. K. Donisthorpe, 19, Hazlewell Road, Putney, S.W.

I would be very glad to exchange Californian butterflies for English blues especially the variable \circ s, and the blue \circ s of coridon such as have been recorded by Keynes and others.—Fordyce Grinnell, Jr., 712, East Orange Grove, Paradena, California, U.S.A.

Wanted.—Perfect condition only Cardamines & s, Sinapis, Hyale, Cardui, Adippe, Iris, Cassiope, W-album, Salmacis, Argiolus, Arion, Atropos, Convolvuli, Ligustri, Porcellus, Stellatarum, Fuciformis, Bombyliformis, Chlorana, Quercana, Hera, Villica, Russula & s, Ligniperda, Æsculi, T. cratægi, B. quercâs, Carpini, Bifida, Carmelita, Dodonea, Batis, and many others; also Pupæ Elpenor, Porcellus, Ligustri, Cullunæ, Carpini, Vinula, and many others; liberal exchange or cāsh if preferred. Duplicates.—Perfection Bicuspis, Varleyata, Yellow Dominula, Melanic Consonaria, Melanic Consortaria, Melanic Lariciata, Melanic Abietaria slightly rubbed, Irish Napl, Irish Aurinia, Consortaria, and very many others; also Pupæ Illustraria Pendularia, Tiliæ, and many others.—L. W. Newman, Bealey, Kent.

Desiderata.—Euchloë cardamines from Ireland; also types of E. cardamines from Switzerland, Italy, S. France; var, turritis (S. Italy), var. volgensis, var. thibetana, and of E. gruneri, F. euphenoides, E. damone, and any palearctic species of the genus. Duplicates.—Loweia dorilis and vars., a few minor vars. of R. phlæas (British), and many British lepidoptera.—Harold B. Williams, 82, Filey Avenue, Stoke Newington, N.

MESOPOTAMIA.—I should be glad of information on insects or news of other entomologists in this country.—P. A. Buxton, Fairhill, Tonbridge.

Duplicates.—European butterflies unset on long pins and some set English fashion. Desiderata.—Common British Noctuids.—Hy. J. Turner, 98, Drakefell Road, New Cross, S.E. 14.

Duplicates.—A. coridon vars., including semi-syngrapha, H. Comma. Desiderata.

—A. coridon var. Albicans (Spanish) and var. Hispana (do.), and good butterfly vars., especially from Ireland.—Douglas H. Pearson, Chilwell House, Chilwell, Notts.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. 1918, November 6th; 20th; December 4th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—Meetings: The second and fourth Thursdays in the month at 7 o'clock.—Hon. Sec., Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society).—Hall 20, Salisbury House Finsbury Circus, E.C. The First and Third Tuesday in the month, at 7 p.m. Visitors invited. *Hon. Sec.*, J. Ross, 18, Queens Grove Road, Chingford, N.E.

Toynbee Natural History Society.—Toynbee Hall, at 8 p.m. Entrance fee ls., annual subscription 1s. *Meetings*: Full particulars as to excursions can be obtained from the Excursion Secretary, Miss L. Roberts, 11, St. James, Hatcham, S.E. Hon. Sec., Owen Monk, 8, Shooter's Hill Road, Blackheath, S.E.

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution. Liverpool, on the 3rd Monday in each month from October to April.—Hon. Sec., Wm. Mansbridge, 4, Norwich Road, Wavertree, Liverpool.

East London Natural History Society.—Bromley Public Hall, E. Thursdays at 8 p.m.—Hon. Sec., J. C. W. Shears, 58, Selborne Road, Ilford.

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G. T. BETHUNE-BAKER, Edgbaston.—The specimens that Signor Querci has sent me have all been in first-class condition with exact data, and they show the assiduity and keenness of that able entomologist as also of his wife and daughter.

ERNEST J. O. HARTERT, director of the Rothschild Museum at Tring.—I herewith testify with pleasure that a number of Lepidoptera we have received in 1917, from Miss Erilda Querci were in excellent condition and the price moderate.

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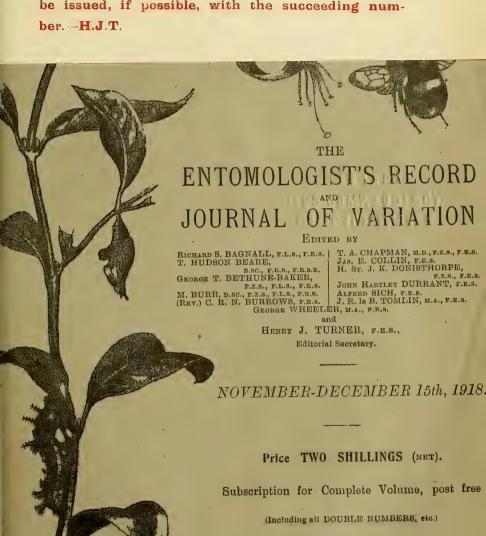
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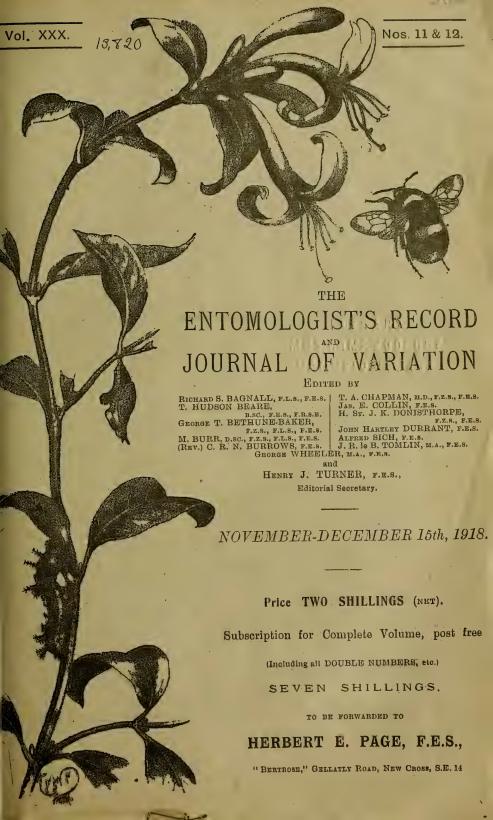
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Gleanings from Dartmoor: with Observations on Dr. Verity's Conclusions on Races of British Butterflies.

By G. T. BETHUNE-BAKER, F.L.S., F.Z.S.

To lovers of the West Country the name of Dartmoor is generally fraught with some happy recollection of lovely scene, of breezy health-giving tramps, or of some pleasant expedition in search of nature's more or less hidden treasures, that nevertheless are not so secretly disposed of as to be undiscoverable to those who have a mind to explore and eyes to see. The moor itself is of very considerable extent, being to-day probably not less than 150,000 acres and, as is well known, forming a part of the Duchy of Cornwall. It is a high table-land, intersected with valleys, through which wind some of the loveliest rivers in England; this table-land is more or less surrounded by an outer ring of "tors" of moderate elevation, the highest being High Willhays, of 2,039 feet, whilst Yes Tor, with only a narrow depression between them, runs it very close at 2,029 feet on the northern side; though probably the most conspicuous and certainly the most popular tor is Hey Tor on the southern side. It may perhaps be interesting to some to know that London Bridge is constructed with granite out of this hill. There are of course throughout the whole of the "Forest," as it is often locally termed, numerous tors cropping up all around. The whole district, with the exception of a very small part near the edge, which is of trap rock, is of granite formation, a great chain of granite masses runs through Devon and Cornwall to the Scilly Islands, appearing here and there on the surface; of these Dartmoor is the largest and attains much greater altitudes than elsewhere. Ironstone is found in pockets, but has not been worked to any profit, though one or two tin mines are still in progress, the mines, however, are not up-to-date, and the quantities of ore raised are comparatively small. Very little grain is raised on the moor itself, the greater part of available land being devoted to pasturage.

All around, however, on the edge of the highland, farms abound, and it is evident that they are well managed and prosperous, for the great majority of the farmers are men who seem to be in a comfort-

fortable position.

It is on the edge of the moor that insect life is most abundant, the villages are numerous, accommodation is easily found, and visitors are generally well catered for. Having family connections within sight of the southern heights, I have for the last thirty years been in the habit of visiting the district annually, often several times a year. This year, alas, through travelling restrictions coupled with an invalid household, circumstances have prevented my going down, so it is well to recall some happy reminiscences of the past and to live in hope of the position being more favourable next year; for those who know the West Country learn to love it, and in the busy times of city life often long for its peace, its beautiful scenery and delicious air.

Last year I was with my family at a little place called Bovey Tracey on the south-eastern edge of the moor; we were four miles from the more or less isolated peak of Hey Tor that I have already mentioned,—and were in the Devon pottery district, and in the midst of regular Devon surroundings, the lanes and heaths being quite typical. On the one side we have a considerable extent of heather

NOVEMBER-DECEMBER 15TH. 1918.

downs, on the other a narrow belt of comfortable farms ascending up to the high plateau of the moor proper. The little village of Manaton, a very favourite spot of mine, is about four or five miles to the northeast, whilst Lustleigh, famed for its weir and deep gorge, is also not far distant in a more westerly direction, being nearly due west of Manaton; all the country is rich in waters and streams in all directions.

My entomological aims were to obtain certain common insects with the object of verifying some of Dr. Verity's conclusions that appeared in this magazine in the year 1916. Among them being Pieris napi, Melanargia galathea, Satyrus semele, Pararge aegeria var. egerides, and others. P. napi, I think, will require a short paper to itself and I have not yet sufficient material from different parts of this country to enable me to verify my previous opinion or to negative it as the case may be.

Satyrus senele, L. was very common on the heath within a quarter of an hour's walk of our rooms and I took close on a hundred specimens in good condition. I had already specimens I had taken in Cornwall, other parts of Devon, and in Wales. I have also a fair series from Kent and Sussex, from Ireland and Scotland, so that one can form a fair idea of the relation of the British race to the Contin-

ental forms.

When Linné catalogued this species in the 1st Ed. Fauna Suecica, p. 238, No. 784, he gave four general references, viz., Hoffn. Ins., 2, t. 8, Pet. Mus., p. 34, No. 307, with a brief diagnosis, Pet. Gaz., p. 22, t. 14, f. 9, and Raj. Ins., 128, No. 6, with a less brief diagnosis, and he himself describes it above thus "wings above brown with obsolete yellow fasciae." From all this I conclude that we should consider the ordinary mid-European race to be the form that Linné had in his mind's eye when he described it. The obsoletion of the yellow fasciae, particularly in the primaries of the males, occurs throughout its distribution, except in the races aristaeus and algirica, and even in aristaeus there is a certain amount of obsoletion in many Italian specimens. The darkest race of all is that described and figured by me in 1891 (Trans. Ent. Soc., p. 202, pl. 12, f. 2) from Madeira and called maderensis—there is no trace of a fascia in the primaries of the male and only the most obscure trace in the secondaries. I have a moderate series from Madeira and all carry this character.

Turning now to Dr. Verity's remarks ante Vol. 28, p. 166, his opening words are, "The Linnean race is a small one," etc. It is evident from this that he considers the Scandinavian race as the one Linné diagnosed in his Fauna Suecica, but in that work he refers to four well-known books of that time, in two of which the species is figured and in two of which diagnoses are given, which diagnoses he transcribes. In his (Linné's) collection there is (fide Dr. Verity) only one Linnean specimen, by which I think he means Scandinavian specimen, because there are others as well, and under the circumstances I have related it is perfectly evident that Linné's semele is a composite race, whose main habitat may be called mid-Europe. Typical semele therefore cannot be limited to the smaller more northern form. Dr. Verity is certainly correct in saying that the British race belongs to this rather smaller race wherein the fulvous spaces are inconspicuous;

the obliteration of these spaces is, however, only confined to the area between the two ocellations in the primaries, and even here it is very variable, for the fulvous yellow marks are nearly always quite prominent around those spots, this obliteration, however, occurs in all the races I am acquainted with except true aristaeus and algirica. I have semele from many parts of Switzerland, France, and elsewhere, and they are always decidedly larger than British specimens. The form found at Bérisal is, I think, the handsomest of the typical (Mid-European) race that I know; some years ago I took a nice series there, both sexes are large, I might say very large, the male is very dark in both wings and in the primaries has the fulvous edging reduced to a minimum and is without any of that colour between the spots, whilst . in the secondaries the fulvous spots are reduced to the wedge-shaped spots Dr. Verity refers to in his form bipicta; in the female the tawny area is large in both wings, brilliant in the secondaries but paler in the primaries, and in the latter the ocellated spots are extraordinarily large and very deep black. The race from the Eastern Pyrenees approaches somewhat the Algerian race, but is greyer and not quite so large and bright.

Bipicta, Verity.—It would be difficult to say where this form begins or ends, the characters given are so very variable. The extreme form is very pretty and easily recognisable but, in a fairly long series, it would be quite easy to pick out a series of absolute gradations; in the female it is rare, but occurs occasionally. It appears to occur throughout the distribution of the species. I have it from Switzerland,

from the Pyrenees, from Germany, and from Ireland.

Scota, Verity.—I have been unable to obtain this variety. I have specimens from different parts of the North of Scotland, but have as yet seen none with the fulvous area at all large. I conclude, therefore, that its locality is extremely limited. In all my Scotch specimens there is a tendency to lose the white fascia on the underside of the secondaries and for the tone of colour to become more uniform. My Digne specimens do not show much increase in the vividness of their coloration, neither does a nice little series that I have from the Eastern Pyrenees.

I am rather surprised to notice Dr. Verity's remark that African specimens get smaller and have reduced tawny areas. I have perhaps a dozen Algerian examples, all of which are of large size, with very

conspicuous fulvous areas.

It may be of interest here to give some observations I have made on the pairing habits of this insect. In several cases I noticed the females invariably carried the males; their courtship, however, is quite interesting. I had the good fortune to observe it twice this summer. The first case I noticed was on a high road, on one side of which was the mountain side and on the other a stretch of about 5 ft. high close wooden fencing, as a protection against a steep almost vertical cliff going right down possibly some 200 or more feet into the sea. The male scented the female and at once accosted her, when she settled immediately on the wooden fencing, the male alighting almost beside her; a momentary caressing with the antennæ was a prelude to a rapid change of position, the male then taking up a "tête-à-tête" attitude, not quite close, but possibly half an inch away, when the antennæ immediately came into play again, both of which stroked and

tapped those of the female, as also the base of her wings; this lasted for some time, perhaps from 10 to 20 seconds, the play of the antennæ being incessant but deliberate, when suddenly his proboscis elongated and he seized hold of apparently the head and an antenna of the female and at the same instant was at her side endeavouring to grasp her abdomen with his prehensors. He failed, and was in a moment face to face with her again, when precisely the same performance took place, though he never again seized her with his proboscis, but quite suddenly (having satisfied himself, I suppose, that his attentions were not unacceptable) assumed the position alongside. Again he was unsuccessful; this time, however, he seized the margin of the lower wing, and without a moment's loss of time he was in front of her again, when the same thing took place; this happened over and over again, but he never succeeded in clasping her, and I noticed several times that she moved her abdomen away, as far as I could see, in a lateral direction rather than an upward one, though I could not be certain. as with the ample secondaries of the female and her rather short aodomen, it was very difficult to see the exact action. The curious part of it to me was that she apparently accepted his attentions at all, only once did she fly away, and then for scarcely a couple of yard's distance, and she seemed by no means unfriendly. The male was quite freshly emerged, but the female must have been out for days, as she was much rubbed and a little torn. In the other instance a similar procedure was gone through except that I did not see the extension of the proboscis, and in that instance the first attempt at copulation was successful.

Melanaryia galathea, L.—I regret to say I find it very difficult to follow Dr. Verity in his remarks on this species (ante l.c., p. 130), particularly for two reasons, the first being that he desires to make the single Linnean specimen, as he calls it, though there are two such specimens, a sort of type which it is impossible to do when the situation is reviewed; and the second reason is—his inference that the British race is his pale race serena, whereas my experience is that the great majority of our British specimens are as dark as the ordinary run of specimens from Switzerland, Germany, and elsewhere. I have taken the insect at Heidelberg and other parts of the Rhine, and they present absolutely no differences from those found in our own islands.

Let us first consider the question of the type. Linné described the species in the 10th edition of the Systema Natura, and Dr. Verity says that he gives Germany and the southern parts of Europe as the habitat, but he omits to note that he gives as his last reference Wilkes Butterflies, with its figure. This shows he knew of its occurrence in England, even though he only gave Germany and southern Europe as the habitat, and it probably means that he had seen the other specimens but had not seen British examples. In the Linnean collection there are five specimens, two of them having continental pins, one of which appears to be labelled by Linnaus. I should say that both of these are Linnean specimens, none of them can be considered to belong to the form procida, though one of the two is larger and somewhat darker than the others, the series seems to me to be typical of the ordinary run of British examples, excluding the pale form serena, Verity, from Derbyshire. I have taken the species, I was about to say, from all over England and Wales, but that would be an exaggeration, but I

have taken it from very many localities. I have long series of it from the Isle of Wight and various parts of Devonshire, and shorter ones from Cornwall, Kent, many parts of Wales, and Dove Dale—which last are certainly not serena. I have it from the York Wolds and elsewhere, all, however, are of the same type, rather smaller than what we may call the Mediterranean form, but fully as large, if not larger, than my captures of the species at Digne, the Cevennes, or the Pyrenees, or in the Engadine, at lower altitudes, such as Alvaneu Bad, etc., whilst a few specimens I took at Baveno, on the Lake of Maggiore, are no larger than my British captures, though they are decidedly darker. I am therefore compelled to form the conclusion that serena is very rare, at all events in these isles, and that our ordinary form is the galathea of Linné.

But to go back to Linné's description, Dr. Verity says (ante l.c., p. 131) that Linnaus "actually states that there are no ocelli on the upper side." I have looked in vain in the original description for this statement. I suppose the remark Dr. Verity refers to is this, "Ocell, in pagina inferiore tantum, obsoleti." This is a totally different thing to saying there are no ocelli on the upperside, and in a brief diagnosis of this kind, means no more than that whilst on the underside they, the ocelli, were an evident character, on the upperside they were not an evident character; that is certainly what I should infer from such a description in brief, and it would apply to the vast majority of specimens that I know, in nearly all of which the ocelli of the upperside have to be sought for, and would not be likely to be mentioned in the brief diagnosis Linné always adopted. It might be well to state that the question of the possibility and advisability of considering the specimens contained in the Linnean collection as types was most carefully considered by our National Nomenclature Committee for Entomology—a committee composed of men of very different opinions and standpoints—and that body unanimously came to the conclusion that it was neither possible or advisable. Many reasons were evident, but one alone I think was sufficient, viz., that it was quite impossible to know whether his descriptions were drawn up from specimens or from the various books he referred to. "Types," as we understand them, were certainly unknown in the time of Linnaus, and I do not think it is reasonable, nor yet scientific, to ask us working entomologists to adopt as typical of Linnean species the specimens that are in the Linnean collection. In making this statement I do not for a moment suggest that Dr. Verity is not scientific, very friendly correspondence with him proves him to be a most accurate and minute observer, but this is a point that I rather think he has probably overlooked.

Pararge aegeria race egerides, Stgr.—Since Dr. Verity's observations appeared (l.c.) Dr. Perkins, and also our late friend Mr. Gibbs, have both written very interesting papers on the species. I have an intimate acquaintance with it in Devonshire, and to a less extent in other districts also, but I believe I have only taken a single specimen of it on the continent, and that was many years ago at Heidelberg, a lovely spot of happy recollections, but never to be visited again by me; for after the present catastrophe I do not desire to see either a Ger-

man or his country any more.

My observations confirm Dr. Perkins entirely so far as the May and June and the summer broods are concerned. I am never able to

thoroughly.

visit Devon in March and April, and therefore I cannot speak of the brood that hybernates as pupæ, the later spring brood and the summer brood are very closely similar in colour and pattern. The April New Forest form, however, entirely agrees with Dr. Perkins' hypothesis, it is decidedly paler above, and the spots are larger and paler, giving the insect an altogether lighter appearance, which contrasts markedly with the September emergence. I have found the species by no means uncommon at Lyndhurst in that month, and it approximates quite closely to the Devon late August examples. I was at Bovey last year during July and the first part of August, and I took one specimen on July 6th and another on July 11th, both somewhat worn—these were evidently late stragglers—both were females—from the May and June brood, then came a gap, and on July 21st I took a fresh male, then followed another gap, and on July 30th the summer emergence began

I have taken the species in the Cotswolds, Wales, and elsewhere, and I agree that on the whole our form is slightly, but very slightly, smaller than the German race with the pale spots, which spots are on the whole slightly smaller. The Irish race, pallida, Tutt, of which I have a fair series, is very decidedly greyer and paler than the form I have been speaking of and the spots are larger and paler. On the underside there is also a marked difference between the early first emergence and the summer one, the hindwings have the median fascia entirely filled in with dark colour and are generally richer in tone than the late spring and summer emergences; this character also applies to my Lyndhurst examples, the early spring specimens being very pretty indeed. I have a nice series sent me by my late regretted friend Frank Lowe, from Guernsey, and these form a pretty, not half-way house but perhaps a third of the way, towards the Mediterranean true aeyeria, they are smallish, if anything under the size of the British race, but with the pale spots much more ochreous, and the brown colour much browner and darker, the ochreous spots are also larger than in our island forms.

Pararge megera, L.—I have not been able to secure specimens of Verity's form caledonica, but my friend says most of our specimens are transitional to it; the species is a common one in both its broods throughout Devonshire and it is quite abundant around Dartmoor. I have been comparing these, as also numerous specimens from Wales, with those I have taken on the Continent. I do not happen to have any from Central Europe, but between those I have taken in Switzerland, at Digne, and the Pyrenees, both "Orientales" and "Hautes," the differences are practically nil, if I were to mix up specimens I have from Digne, the Pyrenees and Eclepens, with any Devonshire or Welsh series, I could not separate them except by their labels, the marginal band, the androconial streak, and the other characters are identical. The suffusion with black scales of the under-surface is largely, I believe, a question of freshness. I have a nice series from Torcross in which they are quite absent, and many from Devon are similarly wanting, whilst a very fresh series from Criccieth, N. Wales, have these scales quite prominently; on the other hand, however, it is to be observed that specimens from Aosta and from Geneva have a considerable suffusion thereof.

Epinephele jurtina, L.-I have been unable to ascertain whether

either ab. pauper or ab. nuragi forms occur in England, they do not in my collection, but then I have only a small series, not more than sixty or seventy, and this number is quite insufficient to enable me to judge; neither have I any ab. anommata, but my series of males is much smaller than of females—males of this species have for some reason never appealed to my sense of beauty. I took a very pretty female last year at Bovey in which the fulvous patch of the primaries is entirely replaced by very pale straw colour, the underside being also similarly affected. I have also a large male from Dartmouth with a distinct tawny patch on the primaries below the ocellus, from the general appearance it is not improbable that this may be a gynandro-

morph; I shall dissect it shortly, I hope.

Pyronia tithonus race britanniae, Verity.—When Dr. Verity is speaking of the ocelli in this species he is evidently referring to the underside and I am constrained to think a slip has occurred, as he says, "the number of ocelli tends to increase, as many as five on the forewing and three on the hindwing may exist." I think it should be three on the forewing and five on the hind. This is quite correct, and I have specimens with as many as six on the hindwing, but three on the forewing, though occasionally present, is really rare. I quite accept Dr. Verity's racial name, our island form is decidedly handsomer and more highly coloured than the general run of continental specimens. I have devoted special attention to this insect and have taken a considerable series in the last three years from different localities.

Aphantopus hyperantus, L.—This species occurs all over the moor, even on some of the exposed districts. There is nothing to be added

to Dr. Verity's summary.

Coenonympha pamphilus, L.—I think Dr. Verity is quite right in separating out lyllus, Esper, from this species. I am now preparing genitalia mounts and rather expect to find them showing specific divergences. The Asia Minor form (and I suppose the Greek race, but I have no specimens from that country) called by Rühl marginata, is quite worthy of the name. I have a good series from Brussa and also some from the Caucasus, the very broad and dark margins to both wings and the larger distinct black apical spot render the form recognisable at a glance, the underside is variable, some specimens being transitional towards lyllus, others being very dark and true pamphilus in their coloration; the underside of the Caucasian specimens is very dark and they certainly belong to the Linnean species. I have not sufficient examples of Verity's australis from the South European localities to judge whether they are really at all constant in their pattern or not, the few I have are variable, but I must own I am sceptical as to the need of giving our British race a varietal name.

To come back now to the theme I started with, to wit, Dartmoor and its lovely neighbourhood. Last year I spent some time, July and part of August, at Bovey Tracey, and from there I walked far and wide; I remember being surprised when I was on the top of Hamel Down, a very bleak spot, to net a nice female Celastrina argiolus, of course the second brood, but it was a long way from its natural food-

^{*} Mr. Wheeler, who has been studying this species lately, tells me there may be four spots (counting the double one as one) both above and below on the forewing and five above and seven below on the hindwing.—G.T.B.·B.

plants, and it was a calm beautiful day, and so it could not have been blown up there, but there it was until it found a home in one of my boxes. On July 1st we had a wet morning, but the sun shone out well in the afternoon, though the foliage was still much bedewed, when on my way back from posting letters what should fly past but a Colias edusa. Naturally, I ran after it, and there settled on a bramble was a lovely quite fresh specimen, from its absolute spotlessness I should think it was in its first flight; it was however the only one I saw. All the three "whites" were common, napi especially so, and of this I took a large series of the second brood. There is considerable variation in these, more particularly so in the undersides. I am still accumulating specimens of this insect when I can, the important thing being to get series of both broods from the same locality. It will be interesting perhaps to observe that I saw several copulations of napi, and in each case the male carried the female in flight. Melanargia galathea was very common in one small area, but its habitats though wide-spread, are very circumscribed. The whole of the Argunnidae are to be found in the neighbourhood, and I think the Melitaeae also. M. aurinia is not uncommon within half an hour of my rooms in the proper season, and even in July I took one very worn specimen. M. athalia is also to be found in the district. Brenthis selene and B. euphrosyne are always in evidence, whilst the three large species are common, and Dryas paphia and Argynnis cyclippe (adippe) are extending their range from the valleys and more sheltered spots even on to the moor itself. I was able to confirm observations of others as well as my own as to the copulating habit of paphia, for I saw the male carrying his mate several times; with aglaia, on the other hand, the female carries the male; I saw two instances of this. I was able to make extended observations of the egg-laying of D. paphia. In the cases under my notice they were always laid on the common bracken fern, sometimes on the fronds, but sometimes on the stem. I followed down one female in a lane and saw her settle in the hedge, creeping well in, but as it was fairly open I could see her well. She approached some bracken, feeling about with her in-turned abdomen she tried several stems before making her selection, one broken stem (not bracken) she spent much time over, but finally found one to her liking and laid a single ova low down on the stem, perhaps four or five inches from the root, then she flew out and preceded to another spot and did likewise. Where there are large areas of the fern, however, such as Lustleigh Cleave and down by the weir, they settle on the fronds and bending their abdomen underneath deposit an egg below. not remember to have seen them deposit two ova at the same time, and where two are discovered together I should suppose them to come from different specimens. Aglaia is common all over the moor even in the most exposed parts. Another species common in all the less exposed lanes, but rarely seen on the high roads, is Aphantopus hyperantus, but I have rarely taken any but the common form. Turning to the Lycaenidae, Bithys quercus is to be found in all localities around the edge of Dartmoor and also on the moor itself in sheltered spots, generally flying in the sunshine, but I twice found specimens on the ground; on one case, after a shower I was taking an evening stroll and saw one on the road with wings outspread, it allowed me to box it without trouble and was quite unharmed and a good specimen, I

suppose the shower may have disturbed it. In like manner the only specimen of Strymon w-album that I have taken for years in that district was one taken about 6.30 p.m., after a very hot day, on the ground beside a bridge over one of the small tributaries of the river Bovey, but in this case I think it must have come down to drink as it was settled in the proper butterfly resting attitude. Ruralis betulae occurs more or less all over the district. I have taken and bred larvæ from blackthorn from some of the most exposed parts of Dartmoor, such as Post Bridge and elsewhere. Polyommatus icarus is not common, so for as my experience goes, but is very wide spread. Plebeius aegon (argus) is very common in its own localities and suffused blue females often occur, one pretty little specimen is of the radiate form and has on the secondaries a series of saggitate submarginal blue marks. The second brood of Rumicia (Heodes) phlaeas turned up on August 1st, one specimen having very large spots. Celastrina argiolus is to be found throughout the district, though last year I only took four examples, three females and one male.

Much was said last year (1917) on the abundance of Vanessa io, my own experience confirms this also; I do not remember to have seen such large numbers before. It is a beautiful object in the sunlight, and its black marbled underside is sometimes very striking.

Epinephele jurtina and Pararge megera I have already referred to,

both are common throughout the neighbourhood.

Of the Hesperiidae, the commonest so far as my experience goes is Adopaea flava (thaumas), Hufn., this species being very abundant.

Agriades comma is also by no means rare.

Of the Heterocera I have a very limited personal experience, as I have never been able conveniently to sugar, owing to my being always with nonentomological friends or relations, and most of my captures have been day-flying species or have come in to light—last year this was fairly successful, and it is very interesting to watch the comportment of the different species. Malacosoma neustria dashes about in the wildest fashion until apparently tired out, when it settles and must be bottled immediately; only males visited me, among them, however, were two very pretty pale ochreous specimens. They are, however, very variable in the tone of colour. Cosmotriche potatoria flies wildly about the room and must be caught with a net, though they will occasionally settle for a few minutes, though only to begin again very soon with their mad dance. Anarta myrtilli was very active at first, · but soon settled down quietly. One Prothymnia viridaria, a very dark specimen, put in an appearance, and though not very active was very restless and required several attempts to box it off the ceiling. Bryophila perla was also fairly quiet after the first short excitement, and was a frequent intruder. Both sexes of Crocallis elinguaria put in an appearance and danced about very excitedly indeed, and two specimens of the 20 plume moth were likewise attracted, as also were single specimens both of Hypena proboscidalis and Aphomia sociella. Hydroecia nictitans, a very fresh and brightly coloured specimen likewise paid me a single call and made its home in my cabinet, whilst Leucania pallens, as was to be expected, paid many calls. Of the other Leucaniae, L. litharquria was quite the commonest, but only one very worn L. conigera turned up. Two Caradrina (Athetis) alsines and one Miana strigilis came, whilst of the Pyralidae two specimens of Pyrausta purpuralis were very

lively. One or two Geometers were attracted in like manner, the most noteworthy being Geometra papilionaria and Selenia illustraria.

Turning to the day-flying moths. I have dealt with Zygaena trifolii more than once, it was perhaps remarkable for its entire absence at Bovey Tracey, but Z. filipendulae was common on the road sides, among the broad grassy edgings; at the end of July I visited an old locality near Manaton for Z. trifolii, and found it nearly over. I took, however, two curious aberrations, one with the spots on the left side of the primaries straw colour, and the wing itself brownish, and the other quite symmetrically marked, with the fifth spot entirely straw colour, as also was the lower part of the lower median spot of the primaries and a little straw coloured patch at the anal angle of each secondary—the outer half of the primary had quite lost the usual bronze hue. Whether this can have been due to damp, or whether it is defective coloration, I am unable to say, though I must admit we had very little rain indeed in that part of Devon in 1917. Callimorpha dominula was common among some willows that surrounded a small mine that had been obtained and worked by Germans until the outbreak of the war. It was very fond of soaring high up in the air in the brilliant sunshine. I picked up a single fine ? of Arctia caja in a hedge row. Larvæ did not appear to be abundant, but on some willows a mile below Hey Tor rock Dicranura vinula were in great plenty. Generally speaking, Devon is fairly rich in Heterocera, and some of our best Noctuidae are to be taken within its borders, but these latter are not to be found in the immediate neighbourhood we have been considering.

Insects collected in Salonica district in 1917 and 1918.

By CAPT. GEO. S. ROBERTSON, M.D., R.A.M.C.

Mr. Norman C. Preston has collected most of the following insects in this locality, and I have added a few to his list. He has had them identified by the Imperial Bureau of Entomology, British Museum (Nat. Hist.). We thought it would be of interest to publish the list. All were found within a five mile radius of Salonica.

Diptera. - Bombyliidae: Exoprosopa jucchus, F.

Coleopters.—Carabidae: Carabus cerysi, Dej., Calathus puncticollis,

Meloidae: Cerocoma schreberi, F. Copridae: Copris hispanus, L. Cetonidae.—Epicometis hirta, Poda.

Melolonthidae: Elaphocera gracilis, Watt. One &, new to British Museum.

Lamiidae: Agapanthia cynarae, Germ. Hymenoptera.—Apidae: Eucera tuberculata, F.

ICHNEUMONIDAE.—Paniscus opaculus, Thoms.

Planipennia: Myrmeleonidae: Creagris plumbeus, Oliv.

Nemopteridae: Nemoptera sinuata, Oliv.

Rнупснота: Pentatomidae: Dolycoris baccarum, L.

Cicadidae: Cicada atra, Oliv.

ORTHOPTERA.—Mantidae: Empusa fasciata, Br.

ACRIDIDAE: Acrida turrita, L.

Lepidoptera.—Satyridae: Satyrus briseis, L., Melanargia larissa, Hb., Coenonympha pamphilus var. marginata, Staud.

Nymphalidae: Issoria (Argynnis) lathonia, L., Melitaea phoebe, Knoch, Melitaea didyma, Ochs., Pyrameis

cardui, L.

Lycaenidae: Polyommatus (Lycaena) icarus, L., Chrysophanus thersamon, Esp., Rumicia (Chrysophanus) phlaeas, L., Tarucus theophrastus, F., Strymon ilicis,

Esp.

Papilionidae: Papilio machaon, L., Papilio podalirius, L. Pieridae: Pontia (Pieris) daplidice, L., Pieris brassicae, L., Pieris rapae, L., Aporia crataegi, L., Colias edusa, F., Colias hyale, L.

Hesperiidae: Adopaea lineola, Ochs., Adopaea flava (linea), Fb., Erynnis alceae, Esp., Gegenes nostrodamus,

È.

Noctuidae: Catocala conversa, Esq.

Sphingidae: Agrius convolvuli, L., Sesia stellatarum, L. Geometridae: Rhodostrophia calabra, Pet., var. tabidaria, Z.

Zygaenidae : Zygaena hilaris, Ochs. Aegeriidae : Aegeria ichneumoniformis, F.

I thought you might like the above for publication in the Record, as I felt that everyone, scattered over the globe as we all are now, should give a few stray notes, which might perchance give information as to the distribution of species, as we are often posted to places miles away from the "beaten track." The main trouble is that we have great difficulty with luggage, and it is hopeless to try to collect seriously owing to other duties and the question of nets, boxes, books, etc., etc. Who would have thought a few years ago that I would have written you an "Epistle from the Thessalonians"!!

Zygaena filipendulae and Z. lonicerae hybrids. By THOS. GREER.

I was much interested in the notes which have appeared in the *Entomologist's Record* on the above subject, by Mr. Bethune-Baker and the Hon. H. Onslow, and as an additional contribution send my obser-

vations of these species from this district (East Tyrone).

Of Z. filipendulae there is a large colony on the edge of a cut-out bog in the neighbourhood, and it also is present in other localities, but only in sparse numbers. In the damper portions of this bog Z. lonicerae is also to be found resting on thistles (but I have never observed the two species flying together). Here, for several seasons, I have taken a six spotted Zygaena flying with filipendulae in early July, these are to be distinguished from the latter by the spots on the undersides of the superior wings being distinct, as in lonicerae, and not blotched over the disk of the wing as is the case with filipendulae, and a broad border to the anterior wings. In some of these specimens the sixth spot is well defined, and in others it is reduced to a mere dot, the ground colour varying from a bright steel blue to a bronzy green; in two examples the superiors are of a very pale blue, with the spots and inferiors pink, the fringes and antennæ, greyish-white.

I know nothing of the early race of Z. filipendulae here, both species appearing on the wing about the same date, viz., from the end of June to the end of July. Z. lonicerae is locally abundant, being almost confined to low lying meadows, which are in part subject to winter floods (at the present time one of the best localities for this species is covered with at least a foot of water).* The food-plant here is the meadow vetchling (Lathyrus pratensis); the larvæ generally spinning their coccoon on the stems of reeds and tall grasses edging the small stream, in preference to rushes, etc., growing beside the food-plants; and often wandering a long way to do so. The imago is to be found in July, flying in the sun or resting and feeding upon the flowers of the Marsh Thistle (Cnicus palustris).

On July 4th, 1917, two Z. lonicerae $\mathfrak P$ having emerged from collected cocoons, I conveyed them to the *filipendulae* locality, and had the satisfaction of getting both paired within a few minutes; the $\mathfrak F$ s being attracted in large numbers, and each $\mathfrak P$ as far as I could observe had no difficulty in pairing with the chosen $\mathfrak F$. After a short time I brought the paired moths home and the $\mathfrak P$ s laid a number of fertile ova, but I failed to bring the larvæ through the winter, no doubt due to keeping them indoors, instead of putting them out in the open on a

growing plant of Lotus.

These notes are very incomplete; I had intended to try and secure the reciprocal cross Z. filipendulae $Q \times Z$. lonicerae Z this season, 1918, but the few cocoons of the former species that I was able to collect all produced Z s.

SCIENTIFIC NOTES AND OBSERVATIONS.

Early and late Marriage-flights of Ants.—Formica rufa, the common wood-ant, is one of the earliest of our ants to appear and the last to retire into winter quarters. Sex pupæ and sometimes adult ♀♀ and ♂ may be found in the nests during February, the temperature under the incubating nest-heaps keeping a uniformly high level, but I have never observed a marriage-flight before May until this spring. At Graffham, Sussex, I first noticed the ants out on their nests on February 17th, when I was struck with their remarkably well-fed appearance after the winter, and they first began to frequent their roads on March 12th. Exactly a month later, on April 12th, the first marriage-flight took place. It was an exceptionally fine day, and innumerable♀♀ and ♂ ♂ were flying and walking about on the roads. Copulation was not observed. Another flight occurred on April 24th, in the same place, and another on the 22nd, about a mile away. It would be interesting to know whether earlier flights than this have been recorded.

On the other hand some late flights were seen in this locality. One of Lasius umbratus, on October 23rd, near Petworth, was exceptionally late, and still later, on the 25th, I picked up a partially dealated $\mathfrak P$ of Lasius fuliginosus. This species usually flies in May, and this individual had probably remained in the nest all the summer. At the date of finding her the colonies of this species in the neighbourhood had already disappeared for the winter.

^{*} Perhaps some of the contributors to the *Entomologist's Record* could offer an explanation as to how the species continues to exist under such conditions.

I introduced this 2 to a colony of 300 or 400 *umbratus* \$\delta\$ with brood, and she was instantly accepted, the only sign of hostility being occasioned by her one remaining wing, which was soon removed.

On March 23rd and 24th, and on April 24th, I found solitary dealated 2 2 of L. umbratus and of L. mixtus here. The sexes of these species usually fly in August and September, but some evidently return to the nest and leave it again later, as they cannot exist without attention and food. On one occasion, January, 1901, I found one in the streets of Oxford, and have on other occasions picked up specimens at unusual times of the year.—W. C. Crawley.

ABRAYAS GROSSULARIATA AB. EXQUISITA.—I have had the good fortune to breed an extremely beautiful and striking aberration of this very interesting species. It is of Lancashire and Yorkshire origin, and among its progenitors are varleyata, albipalliata, and inchalcea. There being five specimens of this novelty, I have deemed it worthy of an

aberrational name, and append description herewith.

ab. exquisita, n. ab. Forewings with black shoulder-knot at base: then a broad white median band containing a conspicuous black discal spot: then a broad black band extending to outer margin, except that it is bordered outwardly with a band of large white cuneate blotches edged with black towards the fringes. Hindwings without black shoulder-knot, with base therefore white, the rest of the wings to the outer margin similar to the forewings. Five specimens, bred June, 1918. Besides these I also bred two specimens entirely suffused with a delicate bronze (instead of white), except at base of hindwing, which is white. For the sake of convenience I call this form exquisita-aenea.—(Rev.) G. H. Raynor, Hazeleigh Rectory, Maldon November 6th, 1918.

POTES ON COLLECTING, Etc.

Note on Lepidoptera at Chichester and neighbourhood.—I cannot say that I find the season of 1918 a good one for Lepidoptera. Of butterflies Dryas (Argynnis) paphia, Argynnis aglaia and A. cydippe (adippe) and Limenitis sibilla were abundant in woods here during July. The first L. sibilla was taken on June 25th. Apatura iris was also seen in July (but not taken) on the outskirts of the woods. In the middle of the month Sesia (Macroglossa) stellatarum was noticed in the garden and a battered Pyrameis cardni was flying over flower beds late in September.—Joseph Anderson, Chichester.

Sirex gigas at Chichester.—A fine female Paururus (Sirex) gigas was taken here and brought to me by a boy on July 17th of this year.

—Joseph Anderson, Chichester.

DIOMORUS ARMATA, CRABRO CLAVIPES AND HOMALUS AURATUS.—From two pierced bramble stems, collected last winter at Market Bosworth, I extracted in May cocoons identical with those of *Crabro clavipes*. In addition one stem contained a Chrysid cocoon. Instead of Crabro, I obtained, during the next two or three weeks, a series of the Chalcid, *Diomorus armata*, Boh., as follows:—From one stem, 5 *Diomorus &* (these appearing first), 1 2 and, in addition, a small Ichneumon; from the other stem, 3 *Diomorus* 2 and from the Chrysid cocoon,

Homalus auratus. No Crabro emerged.—L. A. Box, Lieut., Great Glen, Leicester. November 18th.

Stray notes on Nests of Myrmica.—I kept various nests of Myrmica scabrinodis when I reared the larva of Lycaena arion, and again for the past twelve months I have had nests of the same species, and latterly of Myrmica laevinodis. Mr. Donisthorpe asks me to jot down some of my observations, which I do with some misgivings, as though one or two items I have mentioned to him may, be of interest, I unfortunately made no notes of them at the time of their occurrence, so have to trust to memory, which is not always a safe proceeding. I kept notes of my Lycaena larvæ and their relations with the ants, but of the ants the only notes I made had reference to the headless ant, whose history is given on page 42 of this year's Ent. Record.

The nest of *Myrmica scabrinodis* in which the headless ant had lived, was without a queen and was falling short of brood, especially as I had robbed it of some to supply nests with larvæ of *L. alcon*, the

alcon in this nest having died.

On April 8th, 1918, Mr. Donisthorpe sent me three or four lots of M. scabrinodis for the sake of the broad in them, wanted for L. alcon. One of these lots, a small one with little brood, possessed, however, a queen. As I had no other use for this small lot I put the queen without any of her own workers with her into the nest of the headless ant, knowing it was rather a risky experiment. The ants, however, almost immediately accepted her, and in the few following weeks she laid many eggs and a good deal of brood was raised from them; a little later, however, there were no more eggs and I could nowhere find the queen, what became of her I don't know; this nest did not receive close attention, which was devoted to those containing L. alcon. Quite lately there have been eggs in this nest which must certainly have been laid by workers, these duly hatched. Males and females hatched in this nest in July, but were not very numerous; in August and September only males appeared; on September 15th and 16th I removed 87 males from this nest, and on October 5th 4 more had matured, and there was no brood whatever in the nest.

Two nests of M. laevinodis each possessed several queens, one of them three, the other four. In one of these during August (and end of July) there hatched a large number of \mathfrak{F} s and no \mathfrak{F} s. Whenever examined and the ants thereby disturbed, these \mathfrak{F} s harassed the workers very greatly, they got on their backs, almost preventing them from moving, and seemed to be trying to pair with them, but without any approach to success. They even harassed each other in a similar way. Whether this occurred except on disturbance I don't know. No trace of such behaviour was seen in any other nest, though several presented many \mathfrak{F} s, especially the M. scabrinodis nest of the headless ant. In this nest \mathfrak{F} s were in considerable excess. My observation in this case was not close enough to say whether they came from the worker eggs, but as all of these fed up, short as the time was, it may have been so.

The different behaviours of the ants in different nests, in the matter of restlessness and attempting to escape was considerable. My nests were rather makeshifts, and removing contents of midden and supplying food, etc., could only be done by more or less opening the nests.

In one nest this was a very difficult business, the moment the nest was opened all the ants were in a ferment attempting to escape. In one or two others one could open the nest considerably, yet the ants made little attempt to escape, those that did so being individual wanderers, without any special object in view, and not a few ants retreating, even hurriedly, into the nest on finding there was an opening to the outer world.

Feeding them was often difficult, especially in winter, being kept in a temperature of say about 60° they did not in any sense actually hibernate, my procedure was guided by instructions given me by Mr. Donisthorpe, and I found my experience, so far as it went, precisely agreed with what he told me. Honey on a slip of glass was always more or less acceptable, and the slip was almost always used by the ants as a midden, though sometimes they would use an awkward corner of the nest for this purpose. I found that eggs were laid, in the few cases in which I had queens, and the larvæ fed up more rapidly when plenty of food was given, but at times they did not seem to accept, or use, the food given so fully as I expected, they certainly appeared to get tired of any diet and welcomed a change. Insect imagines seemed to please them best, they would hardly look at larvæ. nor on the few occasions I tried it did they touch meat. Earwigs they liked, but rapidly got tired of them. Diptera, especially Tipulidae, were most appreciated of anything I gave them; house-flies, like earwigs, were soon neglected. They would not touch the common yellow dung-fly. They all refused earthworms, though I have seen ants about a dead earthworm on paths, etc., but these ants were probably not Myrmica. Larvæ of other genera of ants, of which umbratus and dava were tried, were neither accepted as brood nor eaten, but rejected and placed on the midden.—T. A. Chapman. September, 1918.

Some Surrey Coleoptera.—Two specimens of Mordella aculeata were taken by me near Horsley, August, 1896, and June, 1897, one by sweeping the long grass in a plantation of young firs, and the other on the roadside herbage in one of the lanes. A specimen of Agrilus sinuatus was swept up by me at Mickleham, in September, 1909, close to some very large hawthorns. These species are not mentioned in the "Victoria History of the County of Surrey," and should have been recorded before. Subsequent visits have not produced further specimens.

Among the Lady-Beetles* taken by me at Oxshott this year is a specimen of Coccinella septempunctata, the front angles of the pronotum, which are usually white, being of a bright red, quite unicolorous with the elytra; a remarkably pretty insect when alive. Another good thing from the same locality is a specimen of Anatis ocellata, which seems referable to ab. hebraea of Linnæus, who, however, described it as a separate species from ocellata. The spots are united into longitudinal streaks, partly abbreviated. There seems to be only one other British record of it—in 1895—though Weise in 1879 gives England

^{*} This expression, "Lady-Beetle," which is used in the publications of the Carnegie Institution of Washington, is far preferable to "Lady-Birds," and it would be well if its use became general.—W.J.A. [I must say I do not agree with Mr. Ashdown; "Lady-bird" being a much older and more preferable name.—H.D.]

as a locality. Specimens intermediate between this and the type are

of frequent occurrence at Oxshott.

Many varieties of Aphidecta (Adalia) obliterata have been taken by me at Mickleham in the last 20 years, on larch (now mostly cut down), and on other trees. There are several with four and six spotted elytra. Also four specimens of a smoky colour with black legs, and a fine black aberration, which should perhaps receive names, as they do not agree with ab. fumata, Weise, and all the named aberrations seem to have pale legs. The black specimen has elytra entirely black, without markings, the suture and outer edge narrowly brown, thorax, without the usual M mark, legs also brown. The general facies of this beetle, the legs and antenne, at once separate it from any of the black varieties of C. hieroglyphica, a large number of which are in my cabinet, and it could not possibly be mistaken for that species.

Mr. Donisthorpe has kindly inspected all the specimens referred to and confirms the identifications.—W. J. Ashdown, Leatherhead. Sep-

tember 9th, 1918.

WITHERSLACK.—I had intended to go to the south of England in August to work for varieties of Agriades coridon, but circumstances compelled me to take my short holiday earlier, and my brother and I decided to go to Witherslack for Coenonympha tiphon, which I had never taken in England. Finding that the local accommodation was already booked, we stayed very comfortably at Grange-over-Sands and bicycled the four miles or so backwards and forwards.

The afternoon of June 23rd found us on the Meathop Moss, and we worked the various mosses diligently for a week, during which time the sun hardly shone for ten consecutive minutes, while a strong wind was nearly always blowing. The males of C, tiphon were already past their best when we arrived, and it was difficult to get a really nice series, but the \mathfrak{P} s were just coming out and were in fine condition and great variety, but owing to the lack of sun they did not fly freely, and a lot of hard work was necessary to kick them up. It is rather curious that during a week's work and careful searching for the settled insect, only

one couple was seen paired.

The working of a moss is not free from mild excitement, as it is an easy matter to step on heather and find that it overhangs a small patch of bog which will take you over the knee, and sometimes provide accommodation for both legs at once, and after four or five hours you have a distinct impression that any insects captured have been well earned. Swarms of Ematurga atomaria flew out of the heather, and occasionally a male, and more rarely a female Diacrisia sannio (russula) was taken. Lasiocampa quercus blundered about in its usual headlong fashion, and one Macrothylacia rubi was picked up. We did not pay much attention to the moths, but Bupalus piniaria was plentiful among the pine trees, and a few of the pretty little purple Idaea muricata were taken, and also Anarta myrtilli, and one freshly emerged Geometra papilionaria was picked up by my brother. Some parts of the Mosses were occupied by colonies of the Black Backed Gull, of which we found nests with clutches of 1, 2, 3, and in one case 4 eggs, and also young in down, and on the Ulpha Moss they were so numerous and so noisy that it was quite a relief to get away from them. Curlews were also flying round, and we put up a few grouse.

We tried altogether five different mosses in the hope that varied forms of *C. tiphon* might be found, but the two mosses near Witherslack proved to be the most productive, and also the easiest and driest to work.

On one day we rode over to Holker Moss, and the *C. tiphon* taken there were on the average much smaller spotted than the Witherslack specimens. Some interesting flowers were met with. Blue (not dirty purple) Aquilegia was found in several of the mosses, and plants of Jacob's Ladder (*Polemonium caeruleum*), and quantities of Andromeda polifolia and Narthecium ossifragum. A large patch of Thalictrum flavum was growing in a ditch, while some parts of the bog were red with *Drosera*.

Having taken a good series of *C. tiphon* we gave them a rest and tried the country round Grange for varieties of *Polyommatus icarus*. Some very fine blue females were taken and one dark one with orange spots on both upper and lower wings, but no underside varieties could be turned up. *Argynnis aglaia* was most abundant on some of the hill sides, and among the numerous *Coenonympha pamphilus* one was found with the double eye-spot. On a dark fir trunk a smoky-black form of what I take to be *Bōarmia repandata* was found, but it is so different from any form that I possess that I cannot name it with certainty.

The *C. tiphon* are of the usual Lancashire form, but show a large amount of variation both in colour and spotting. On the underside the apical spot is present in all the specimens. In one specimen only the upper wings have no spots at all beyond the apical spot, and in several only very faint traces of one or more spots leading up to three well developed spots. The apical spot has frequently a small one below it, and in one or two cases an additional one above. The lower wings have usually five well marked spots at the anal angle, but in a few cases there is an additional one on the inner margin past the twin spot, which I have not found in any of my foreign or Scotch specimens.*

On July the 2nd we took 2 male Plebeius aeyon, but failed to find any more on the 4th, and were much too early for the female var. masseyi. However, my brother was good enough to stay on, and between July 12th and 17th took a very nice and interesting series. The males are much bluer than any I possess, and the females vary considerably in the amount and quality of the blue. Is it known what is the food plant of P. aeyon on these mosses? for we could find no Leguminous plant in the part where they were taken, and came to the conclusion that they must eat either heather or peat.—Douglas H. Pearson, Chilwell, Notts.

QURRENT NOTES AND SHORT NOTICES.

The following entomological story is quoted from the Daily Chronicle without comment—A trench insect on his neck was annoying him considerably, so when he could spare a moment from his rifle he leant forward, clapped a hand to the spot, and made a capture. At the same instant a bullet struck his helmet. But for having ducked forward He held up the captive between thumb and finger, and

^{*} One specimen, unfortunately damaged, is very striking, as all the spots are drawn to a point outwards.

shook his head. "Don't like to kill you. Saved my life, I guess; what shall I do with you?" Then, with inspiration, "I know,"—clapped it on his neck again—"Put you back on full rations!"

In the Naturalist for September we read that the collection of the Mymaridae collected and mounted by the late Fred Enock has been acquired by the authorities of the Manchester Museum. It contains "a large number of beautifully mounted typical specimens of a group of the Hymenoptera that are parasitic upon the eggs of leaf-hoppers, plant-bugs, and aphids, insects destructive to food plants." The late C. O. Waterhouse had been working on the Mymarids with Fred Enock for some years past. We wonder what has become of his collection of these beautiful "fairy-flies."

The Entomologist for September contains an account of "Butter-flies collected in the Pyrénées-orientals in 1917 and 1918," by J. R. McClyment, with Notes by H. Rowland-Brown; "Gleanings from my Note-books," by J. W. H. Harrison, D.Sc.; "Collecting in 1917," by C. G. Clutterbuck; with a further instalment of the List of British

Noctuidae by R. South.

There is a detailed description of the extremely rare male of the now very common "walking-stick" Bacillus rossii, in the Bull. soc. ent. Fr., No. 12, with a figure of the genital armature.

In the E. M. M. for September, Mr. E. A. Newbery adds a new species to the List of British Coleoptera in Trogophloeus impressus

taken in July, 1877, near Hammersmith.

The field meetings of the Yorkshire Naturalists' Union are usually very popular as well as being very successful from a scientific point of view. In the Naturalist for September we find an account of a visit paid to Crosshills on July 13th, which was attended by close upon eighty; the weather was said to have been "ideal" and the routes chosen for the various sections afforded a capital survey of the natural delights of the valleys of Glusburn and Lothersdale. At the end of the meeting reports were given of the results of the work of the different sections in entomology, geology, botany, bryology, ornith-

ology, etc.

In the Bull. Soc. ent. Fr., No. 12, M. Daniel Lucas reports the capture of Chrysophanus dispar var. rutilus in the forest of Lassivour, Aube, where it occurs in the drier open spaces just as C. hippothoë does in its habitats. It will be called to mind that C. dispar. v. rutilus occurs in some numbers in the Bordelais, but there it frequents actual marshes and areas interspersed with marshy lakes. Corresponding to a different character of habitat there is a difference in the two forms. The form from the Aube is nearly the size of the Bordeaux form, but is distinguished by a more angulated apex to the fore-wing, a less bluish tint on the hing-wings below, with the presence of much smaller black spots on both wings below. The female has the whole area of the fore-wings, except the marginal portion, almost uniformly black, as in the Bordelais specimens. On the discal and extra-discal portions of the fore-wings above, the black spots are much emphasised.

A very interesting little brochure, "printed for private circulation," Memoir of the Reverend Octavius Pickard-Cambridge, M.A., F.R.S., has been on our table for some time. It is written by his son, A. W. Pickard-Cambridge, M.A., Fellow of Balliol College, Oxford. The second of a good life of a hard-working, clever man was a great plea-

sure to peruse. The study of spiders had attracted few workers, and of those few most have but dabbled at rare intervals, so that everything was more or less new and hitherto unknown, when the Rev. G. Pickard-Cambridge began his life's work. There is an uninterrupted series of papers from his pen, commencing with the year 1852 and ending with his last contribution in 1914, when he had reached the age of 86. But his energies were not devoted only to the Arachnida. for we find an enumeration of numerous papers and notes on Lepidoptera, Ornithology, etc., and even Antiquarian Notes, all particularly dealing with the fauna and records of his native county of Dorset. This admirable biography gives us delightful insight into the everyday private life, thoughts and acts of one whom it was a pleasure to know. He is shown in his home circle, in his church, in his village, in the county to which he was so much attached, and in his converse with the world where his talented work secured him an increasing circle of co-workers and admirers. He corresponded with Darwin and others and associated in his Lepidopterous days with the great collectors J. C. Dale, Fred Smith, H. T. Stainton, Sam Stevens, and Chas. Turner, as well as with the men of the next generation, such as N. M. Richardson, E. R. Bankes, J. B. Hodgkinson, W. Machin, W. Farren, G. Elisha, W. H. B. Fletcher, and others. The illustrations, of which there are eight, include a capital portrait, his church, the rectory, and above all, the outside and inside of "the den," as he called the detached building into which the treasures he accumulated for his study had early to be removed from the room they had outgrown. "feeling" in this book is that the writing was a "labour of love" and the perusal seems to bring one into personal contact with a great and strong mind for good and for industry and for progress!

The Reports of the Lancashire and Cheshire Entomological Society for 1916 and 1917 are to hand recently, and record a period of steady continuance during the pressure of the times. The membership varies slightly from year to year, and papers come regularly to hand. Although the bulk of the exhibits at the meetings is Lepidoptera, neither of the two magazines devoted to that order, the Entomologist's Record and the Entomologist, appear to be in the Society's library. The following papers were read in 1916: "Collecting in the Wye Valley," by A. W. Hughes; "Butterfly Collecting in the New Forest," by R. Wilding; "Mosquitoes," by H. T. Carter; "Suburban Collecting," by Wm. Mansbridge; "Notes on the genus Ornix," by F. N. Pierce; and the Annual Address, "Our Collecting Grounds," by the President, Dr. J. Cotton. In 1917, "Recent Experiments in Breeding Aplecta nebulosa," by Wm. Mansbridge; a "Report of the work of the Lancashire and Cheshire Fauna Committee"; "Wallasey and Porthcawl Sandhills, a Comparison," by H. M. Hallet; "The Lepidoptera of an Essex Garden," by F. N. Pierce; and the Annual Address, "Some Aquatic Insects," by the President, Mr. Leonard West. To the Report is added a further instalment of the annotated List of the Lepidoptera of Lancashire and Cheshire. There is also an obituary of one of the oldest supporters of the Society, Lieut.-Col. J. W. Ellis, he having joined in 1877. He was the author of the List of Lepidoptera of the two

In the Bull. Soc. ent. Fr., Signor Enrico Ragusa, of Palermo, makes some observations on the larvæ of Zygaena erythrus and of Z.

minos, showing that they should be treated as two separate species. He points out that Boisduval described and figured Z. minos from Sicily and gave the description of the larva of Z. erythrus as that of Z. minos. Millière makes the same error and suspects a confusion between the larvæ of Z. erythrus and Z. pilosellae. The larva of Z. erythrus is pubescent, of a pale yellow, sometimes greenish, with on each side two rows of a dozen black spots. The larva of Z. minos is very different; it is wholly black, pubescent with a row of eight oval beads on each side of a citron yellow, surmounted by a velvety black point; the head is black with a lighter yellowish collar. The Sicilian race of Z. minos is generally larger than the typical form, and has been named magna by Staudinger.

In the Scottish Naturalist for September are several interesting records of captures in the far north; several Pyrameis cardui in Perthshire in June, Euvanessa antiopa and Amorpha populi, also in Perthshire (a form of the larvæ of the latter was taken with "blood red spots" upon it), Trochilium crabroniformis occurred in Aberdeen, Rhyssa persuasoria was taken in Kincardineshire, the mountain Pterostichus, P. aethiops, at low elevations in Argyllshire and Arran, and the local

Aphodius foetens and A. nitidulus in Arran.

In the Entomologist for October, the Rev. J. W. Metcalfe chronicles the remarkable capture at Rannoch of over forty-five specimens of the rare moth "ant guest" Myrmecozela ochraceella on one evening on one nest of Formica rufa. There is a description of the growth of the Natural History Section of the Bristol Museum, especially of the Insecta collection; the Lepidoptera contains no less than 29 Chrysophanus dispar, 52 Laelia coenosa, 19 Cleora angularia, and many well-authenticated immigrants. Mr. H. Rowland-Brown writes an Obituary of the late W. F. de Vismes Kane, in which he (H.R.-B.) states he has begun the revision of Kane's well-known "European Butterflies" with a view to a new edition when the war is over.

SOCIETIES.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

April 15th.—Paper: The British Social Wasps.—Mr. H. M. Hallett, F.E.S., read an interesting paper on the British Social Wasps; each species was taken in detail and any outstanding feature in its bionomics convincingly described. Considerable discussion centred round the position of Vespa austriaca as the "Cuckoo" wasp. Mr. Hallett said that he had witnessed the wasp scraping fibre from an old gatepost as if it were gathering nest material; he also stated that in spite of such an observation it was quite likely that a species, which produced no workers, would depend largely, if not entirely, upon foster-parents for its progeny. It appears that this tendency of V. austriaca requires still further investigation. The discussion also elicited the fact that we have only one record for Lancashire and Cheshire for the hornet, Vespa crabro.

PSYCHID LARVÆ EXHIBITES.—Mr. F. N. Pierce exhibited living larvæ of Solenobia melanella and Diplodoma ferchaultella from Northants and pointed out that no male of the latter species was known; he drew attention to the differences in the form of the larval case in each

instance and the method of the feeding of the larvæ.

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Variation in T. Carpinata and O. Bidentata.—Mr. W. Mansbridge showed a long series of *Tricopterys (Lobophora) carpinata (lobulata)* from Delamere parents much suffused with fuscous and green in both sexes, but more strongly in the females; also a series of *Odontopera bidentata* showing a continuous pale transverse line formed by the joining up of the second series of spots.

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TENTAMEN

AND .

Verzeichniss bekannter Schmettlinge

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JACOB HÜBNER.

BY .

JOHN HARTLEY DURRANT, F.E.S.

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With Introductory Remarks

BY

G. T. BETHUNE-BAKER, F.E.S.



Introductory Remarks.

It will probably be advisable to give the reasons why it has been decided to give the following digest of *Hübner's Tentamen*, with all the detail that it involves.

It is many years ago since Mr. Durrant, in one of his nomenclatorial investigations, was led to write the great bulk of what follows. He did not then quite complete it, but present day necessities have led him to again go over it and complete one or two details that were lacking.

What then is the real position and authority of the Tentamen?

It was published by Hübner in 1805 or 1806 as a single sheet, and was doubtless sent out to his subscribers with one of the parts of his

vol. V. which was then in course of publication.

Hübner himself definitely refers to it by name in the preface of his Verz. bek. Schm., giving its title, and saying explicitly that he had forthwith made it known, stating also that it, the Tentamen, formed the ground work of his volume that he was then publishing, viz.: the Verzeichniss bekannter Schmetterlinge. This preface was issued with the first sixteen pages of the work just mentioned, in the year 1816.

This proves to my mind that the *Tentamen* was duly published and issued, and that it was known to entomologists. We have, however, confirmatory evidence. In the same year, 1816, Ochsenheimer issued his vol. IV. of the *Schmetterlinge von Europa*, and he says in the preface to that volume that Hübner had published (herausgegeben) the plan of a system of insects in which he had given family and generic names, and he goes on to say that "the sheet (page) only came to me long after the publication of my third volume, therefore I could not adopt it earlier." Ochsenheimer therefore had a copy of the *Tentamen*, and would have adopted it in his earlier volume had he received it sooner. In 1862 Hagen, who was a most careful collaborator, refers to it in vol. I. of his *Bibliotheca*, as a known paper of the author's, giving its date as well before 1810. With this evidence it appears to me to be quite unreasonable and unjust to ignore its publication.

This brings me to the immediate cause of publishing Mr. Durrant's work on this much debated paper. Barnes and McDunnough have recently issued a Check List of North American Lepidoptera, and it fell to my lot to review (Ent. Rec., vol. 29, p. 217) this useful list, and in doing so I could not refrain from referring to their declining to recognise the Tentamen as valid, and I therefore gave briefly some of the evidence of its publication. however, that it was unsatisfactory to leave it with a mere protest, and knowing that Mr. Durrant had tabulated the whole of the paper in question, giving the references, not only to the family names but also to the generic and specific ones, together with citations to the works and the figures already published by Hübner, I felt it would be a real gain to this branch of science to bring the whole matter forward again, and to get the authority of the Tentamen definitely established, as I think it will be; or, if perchance the negative evidence is strong enough to outweigh the positive, we who support its validity may have to bow before evidence that may be brought against it, but such evidence must be unimpeachable. Under any circumstances, however, I feel that the entomological world is, or should be, under a debt of gratitude to Mr. Durrant for his laborious and painstaking and careful investigation.—G. T. Bethune-Baker.



SCHEME.

[ALUCITINA] Hb. Verz. Schm. 428-31 (1826).

Phalanx IX. ALUCITAE (Geistgen) Hb. lc. 428-31 (1826).

Tribus I. INTEGRAE Hb. lc. 428-9 (1826).

Stirps 1. PANPTEROTES Hb. lc. 428-9 (1826).

Familia A. OBNUBILAE Hb. lc. 428-9 (1826).

Coitus 1. Agdistis Hb. lc. 429 sp. 4177 (1826).

Tribus II. TRIFIDAE Hb. lc. 429-31 (1826).

Stirps 1. PTEROPHORAE Hb. lc. 429-31 (1826).

Familia A. *OBTUSAE* Hb. lc. 429-30 (1826).

Coitus 1. Platyptilia Hb. lc. 429, sp. 4178-81 (1826).

Coitus 2. Amblyptilia Hb. lc. 430, sp. 4182-5 (1826).

Familia B. CUSPIDES Hb. lc. 430-1 (1826).

Coitus 1. Stenoptilia Hb. lc. 430, sp. 4186-92 (1826).

Coitus 2. Aciptilia Hb. lc. 430-1, sp. 4193-5 (1826).

Tribus III. MULTIFIDAE Hb. lc. 431 (1826).

Stirps 1. RHIPIDOPHORAE Hb. lc. 431 (1826).

Familia A. VARIEGATAE Hb. lc. 431 (1826).

Coitus 1. Euchiradia Hb. lc. 431, sp. 4196-8 (1826).

[Key to Hübner's system of classification exemplified by the complete family ALUCITAE of Hübner's "Verzeichniss," pp. 428-31, sp. 4177-4198 (names of species omitted).—Jno. H. Durrant.]

```
Verzeichniss.
                         Tentamen.
                                                                  7
               LEPIDOPTERA
                                      ..=LEPIDOPTERA ...
                        PAPILIONES = Phal. I. PAPILIONES
                                                                  7
            Phalanx I.
                                                                  8
             Tribus I.
                       NYMPHALES=Trib. I. NYMPHALES
                                                                  8
                    I.
                        NEREIDES
                                       =Stirps I. NEREIDES...
                                         Fam. B. FULVAE
                                                                 10
                                         Coitus 3. Mechanitae
                                                                 11
         [i.e. Nereis Hb. (1805).
                                       i.e. Mechanitis F. (1807).]
                                         27 Mechanitis eucrate
                                                [Hb. MS.]
                                         28 Mechanitis lysimnia F.
               1 (type) Nereis polymnia = 29
                                                      polymnia L.
                                                ,,
                                          (Hb. Ner, fulv. Polymnia)
                        LIMNADES ... = St. II. LIMNADES...
                   II.
                                                                 14
                                         Fam. B. FERRUGINEAE 15
                                         Coit. 1. EUPLOEAE ...
           [i.e. Limnas Hb. (1805).
                                         i.e. Euploea F. (1807).]
                                         77 Euploea hegesippe Cram.
                                         78
                                                    plexippe L.
                                         79
                                                    philene Cram.
                                         80
                                                    artenice Cram.
"Not a Fabrician 1(type)Limnaschrysippus=81
                                                    chrysippe L.
type of Euploea
                                                       (Hb. 678-9.)
F. Illig. Mag. VI.
                                          82
280(1807)" Prout.
                                                    alcippe Cram.
                                         83
                                                    dioxippe Cram.
                                          St. III. NAPAEAE 17]
                   III.
                        LEMONIADES = St. IV. LEMONIADES
                                          Fam. B. LATEREAE ...
                                                                 27
                                          Coit. 1. Melitaeae ... 28
         [i.e. Lemonias Hb. (1805).
                                         i.e. Melitaea F. (1807).]
                                         221 Melitaea phaëtaena Hb.
                                                        (phaëton F.)
                                          222
                                                    agrotera Brgstr.
                                                          (Hb. 1-2.)
              1 (type) Lemonias maturna = 223
                                                    maturna L.
                                                      (Hb. 598-601.)
                                         224
                                                    cynthia Schiff.
                                                       (Hb. 569-70.)
                                         225
                                                    artemis Schiff.
                                                          (Hb. 4-6.)
                   IV.
                        DRYADES
                                       =St. V. DRYADES
                                         Fam. B. PHALERATAE 30
```

[i.e. Dryas Hb. (1805).

Coit. 6. ARGYRONOMAE

263 Argyronome lampetia

i.e. Argyronome Hb. (1818).

32

```
Tentamen.
                                      Verzeichniss.
                                            columbina
                                264
                                                    Cram.
                                265
                                            laodice Pall.
                                               (Hb. 67-8.)
   1 (type) Dryas paphia
                              =266
                                             paphia L.
                                              (Hb. 69-70.)
                                           pandora Schiff.
                                267
                                             orthosia Hb.
                                268
                                             (metea Stoll).
            HAMADRYADES = St.VI. HAMADRYADES 32
                                Fam. D. ANGULATAE
                                Coit. 4. INACHES
                                i.e. INACHIS Hb. (1818).
1i.e. Hamadryas Hb. (1805).
      1 (type) Hamadryas io. = 322 (type) Inachis io L.
                                               (Hb. 77-8.)
                           ...=St. VII. NAJADES ... 38
              NAJADES
                                Fam. E. LUCTANTES
                                Coit. 3. Limenites ... 44
                            i.e. Limenitis F. (1807).]
[i.e. § NAJAS Hb. (1805).
                                402 Limenitis sibylla L.
                                               (Hb. 103-5.)
                                           camilla Schiff.
                                403
                                               (Hb. 106-7.)
                                          populi L.
      1 (type) § Najas populi = 404
                                              (Hb. 108-10.)
                                405
                                           procris Cram.
   [§ Homonymous with Najas (1771) Vermes.]
                             =St. VIII. POTAMIDES 46
        VII.
              POTAMIDES
                                Fam. B. SUPERBAE ... 48
                                Coit. 4. Doxocopae ... 49
                            i.e. Doxocopa Hb. (1818).]
[i.e. Potamis Hb. (1805).
                                459 Doxocopa erminea
                                                     Cram.
          1 (type) Potamis iris=460
                                           iris L. (Hb.
                                               117-8, 504.)
                                461
                                           ilia Schiff.
                                               (Hb. 115-6.)
                                           agathina Cram.
                                462
                                463
                                           astasia (clytie
                                             Schiff. (Hb.
                                                    113-4.)
                                           epilais Hb.
                                464
                                           (polyxena Cram.)
                            ...=St. IX. OREADES
        VIII.
              OREADES
                                Fam. D. NUBILAE
                                                     ... 57
                                 Coit. 2. MINOES
                                                     ... 57
                              i.e. Minois Hb. (1818).]
   [i.e. § OREAS Hb. (1805).
```

```
Verzeichniss.
                    Tentamen.
                                     546 Minois phaedra L.
                                                   (Hb. 127-9.)
                                     547
                                              alcyone Schiff.
                                                   (Hb. 125-6.)
                                              hermione L.
                                     548
                                                   (Hb. 122-4.)
circe F.=1 (type) Oreas proserpina=549
                                              proserpina Schiff.
                                              anthe Hb. (perse-
                                    550
                                             phone Hb. 710-11.
                                                       589-90.)
                                              briseis L. (Hb.
                                    551
                                                 130-1, 604-5.)
                                    552
                                              oenomais Hb.
                                                        [? MS.]
      [§ Homonymous with Oreas Desm. (1804) Mamm.]
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                                    671
                                                aegon Schiff.
                                                   (Hb. 313-5.)
                                    672
                                                opilete Knoch.
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                                    673
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                                    842 Jasioniades alexanor
                                                          Esp.
                                                 turnus F.
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                                                   (Hb. 390-1.)
                                    845
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                                                            90
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                                                            93
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                                    980 Catophaga paulina
                                                         Cram.
                                    981
                                                gliciria Cram.
                                    982
                                                cheiranthi
                                                   Hb. (647-8.)
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Tentamen.
                                             Verzeichniss.
        1 (type) Mancipium brassicae = 983
                                                  brassicae L.
                                                     (Hb. 401-3.)
                                       984
                                                  rapae L.
                                                     (Hb. 404-5.)
                                       985
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                                                 (Hb. 664-5, 407.)
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                                 i.e. Protogonius Hb. (1822).
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                                 i.e. Carcharodus Hb. (1822).
                                      1189 Carcharodus lavatherae
                                             Esp. (Hb. 455, 454.)
                                      1190 Carcharodus altheae
                                                     Hb. (452-3.)
                                                  malvae Schiff.
alceae Esp.=1 (type) Urbanus malvae=1191
                                                     (Hb. 450-1.)
                                               SPHINGES
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                    ZYGAENAE
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                                      Coit, 4. Thermophilae 117
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     [i.e. Zygaena Fb. (1775).
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                                                   Schiff. (Hb. 22.)
                                      1266
                                                   peucedani Esp.
                                                       (Hb. 75-6.)
                                      1267
                                                   medicaginis
                                                        Hb. (20.)
                                      1268
                                                   charon
                                                         Hb. (21.)
                                      1269
                                                   viciae Schiff.
                                                         (Hb. 82.)
                                                   angelicae Ochs.
                                      1270
                                                      (Hb. 120-1.)
                                                   lonicerae Esp.
                                      1271
                                                          (Hb. 7.)
                                      1272
                                                   hyppocrepidis
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Hb. (32.)

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Tentamen.
                                                 Verzeichniss.
          1 (type) Zygaena filipendulae = 1273
                                                      filipendulae L.
                                                            (Hb. 31.)
                                         1274
                                                      transalpina
                                                        Hb. (15, 19.)
                                         1275
                                                      cytisi Hb. (26.)
                                         1276
                                                      orobi Hb. (133.)
                                         1277
                                                      trifolii Esp.
                                                         (Hb. 134-5.)
                                         1278
                                                      glycirrhizae
                                                   33
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                                                              (Hb. 1.)
                                                     globulariae Hb.
                                         1294
                                                                (2-3.)
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                                                        (Hb. 99-100.)
§ GLAUCOPIS
                                          1319
                                                     collaris F.
(1805) is invalid as
                                          1320
                                                    aterea Cram.
homonymous with
                                          1321
                                                     imaë (imaon
GLAUCOPIS
           Gmel.
                                                               Cram.)
L.S.N. (13 ed.) 1,
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Lacepède (1799).
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                      incendiaria (MS.) = 1366 Pseudosphex polistes
                                                     Hb. (Ztr. 39-40.)
                                          1367
                                                        zethus Hb.
                                                         (Ztr. 49-50.)
                  [N.B.—Scudder notes that "incendiaria" is altered in
                      MS. in his copy of the "Tentamen" to "polistes"
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Hb. Verz. 1366.

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Tentamen. Verzeichniss.
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1412 ,, faro Cram.
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1461 Oreus gnoma F.
1462 ,, acteus Cram. 1 (type) Eumorpha elpenor=1463 ,, elpenor L.
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1464 " amadis Cram.
1465 ,, licastus Cram.
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1 (type) Manduca atropos = 1494 Acherontia atropos L.
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1495 ,, chionanthi Abb.
1496 ,, morta Hb. (atropos Cram.)
(wirepos Crain.)

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                                                  (Hb. 16.)
                                1540
                                             plumigera
                                            Schiff. (Hb. 17.)
                                1541
                                            carmelita Esp.
                                                  (Hb. 21.)
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   1 (type) Platypteryx hamula=1570
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                                   =1592 Aglia tau L.
                                                     (Hb. 51-2.)
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                                                       (Hb. 56.)
                                     1637
                                                spini Schiff.
                                                       (Hb. 55.)
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                                    i.e. Liparis Ochs. (1810).7
        1 (type) Hipogymna morio = 1644 Liparis morio L.
                                                    (Hb. 231-2.)
                                    1645
                                               eleuteria Stoll.
                                    1646
                                               diaphane Cram.
                                    1647
                                               spectra Hb.
                                                 (festiva Cram.)
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                                  i.e. Euproctis Hb. (1822).]
       1 (type) Leucoma auriflua=1660 Euproctis auriflua Schiff.
                                                     (Hb. 68-9.)
                                    1661
                                                chrysorrhoea L.
                                                      (Hb. 67.)
                                    1662
                                                argyrorrhoea
                                                    (? Hb. MS.)
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                                    i.e. Orgyja Ochs. (1810).]
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                                                      (Hb. 81.)
                                    1677
                                              achatina Abb.
                                    1678
                                              tephra Hb.
                                    1679
                                              abietis Schiff.
                                                    (Hb. 82-3.)
     1 (type) Dasychira pudibunda=1680
                                              pudibunda L.
                                                    (Hb. 84-5.)
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                                1683 Ichthyura anastomosis
                                               L. (Hb. 87.)
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                                                  (Hb. 89.)
                                1685
                                             anachoreta
                                            Schiff. (Hb. 88.)
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                                                  (Hb. 112.)
                                         modesta Cram.
          [‡N.B.—HIPOCRITAE is used in "Verz.", p. 169, for
        St. VII., which does not contain its type jacobaeae.]
          *HIPOCRITAE nec. St. VII.* HIPOCRITAE
          [N.B.—HIPOCRITAE of the "Verzeichniss" does not
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                               =1909 Dasysoma catax L.
                                                  (Hb. 168.)
                                 1910
                                             eueria Knoch.
                                          12
                                                (Hb. 166-7.)
                                 1911
                                             lanestris L.
                                               (Hb. 169-70.)
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      [i.e. Trichoda Hb. (1805).
                                      1972 Malacosoma loti Ochs.
                                                     (Hb. 256-7.)
                                      1973
                                                  castrensis L.
                                                     (Hb. 177-8.)
                                                  neustria L.
          1 (type) Trichoda neustria = 1974
                                                    (Hb. 179-80.)
                                                  disstria Hb.
                                      1975
                                                (=*neustria Abb.)
                                                  franconica
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                                                           Cram.
                                                  quercifolia L.
        1 (type) Eutricha quercifolia = 1951
                                                     (Hb. 187-8.)
                                      1952
                                                  populifolia
                                           Schiff. (Hb. 189, 254.)
                                      1953 Phyllodesma ilici-
                                                          folia L.
                                              " tremulifolia Hb.
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1 (type) Heteromorpha coeruleocephala = 1989
                                              ., caeruleocephala
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                                      1994 Xyleutes crassa Drury.
             1 (type) Teredo cossus =1995
                                                 cossus L.
                                                       (Hb. 198.)
                                                 terebra Schiff.
                                      1996
                                                       (Hb. 197.)
                                                 strix L.
                                      1997
        [§Homonymous with Teredo L. (1758) Moll.]
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2016 Gorgopis libania Cram.
1 (type) Hepiolus humuli = 2017 ,, humuli L.
(Hb. 203-4.)
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[i.e. Apatele Hb. (1805). i.e. Arctomyscis Hb. (1822).]
1 (type) Apatele aceris=2041 Arctomyscis aceris L. (Hb. 13-14.)
2042 "euphorbiaeSchiff. (Hb. 12.)
2043 ,, esulae Hb. 613.
2044 ,, euphrasiae Bkh.
(=pepli Hb, 614.)
2045 ,, cyparissiae Hb. (529, 615).
2046 ,, megacephala
Schiff. (Hb. 10-11.)
II. DIPHTHERAE=St. II. DIPHTHERAE 202
Fam. A. PRAECIPUAE 202
Coit. 3. Momae 203
i.e. Diphthera Hb. (1805). i.e. Moma Hb. (1822).]
2049 Moma ludifica L. (Hb. 580-1.)
orion Esp.=1 (type) Diphthera*aprilina=2050 , *aprilina L.
(Hb. 22.)
2051 ,, astur Cram.
III. JASPIDIAE =St. III. JASPIDIAE 203
Fam. B. NUBILAE 204
Coit. 2. Euthalae 205
[i.e. Jaspidia Hb. (1805). i.e. Euthales Hb. (1822).]
1592 algae F. = 1 (type) Jaspidia 1592c algae F. + spoliotricula = 2061 Eutholes spoliotricula
calligrapha Bkh. spoliatricula = 2061 Euthales spoliatricula Schiff. (Hb. 26.)
2062 " calligrapha Bkh.
(Hb. 530.)
2063 ,, fraudatricula Hb. (28.)
2064 ,, raptricula
Hb. (29.)
2065 , mendacula
Hb. (520).

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                                    i.e. Meganephria Hb. (1822).
1813 oxyacanthae L.=1 (type) Miselia oxya-
                                cantha=2069 Meganephria toxiocan-
                                                     thae L. (Hb. 31.)
                                         2070
                                                     bimaculosa L.
                                                           (Hb. 32.)
                                         2071
                                                      oleagina Schiff.
                                                           (Hb. 33.)
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                                         2106
                                                     xanthomista
                                                          Hb. (647.)
              1 (type) Polia flavicincta=2107
                                                     flavicincta
                                                     Schiff. (Hb. 46.)
                                        2108
                                                     dysodea Schiff.
                                                           (Hb. 47.)
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                                         Coit. 8. Tracheae ... 219
         i.e. Achatia Hb. (1805).
                                        i.e. Trachea Ochs. (1816).]
         1 (type) Achatia atriplicis=2203 (type) Trachea atriplicis L.
                                                           (Hb. 83.)
         | Hence Achatia Hb. Tent. (1805) = Trachea Hb. Verz. (1822).
               Type atriplicis L.
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Verzeichniss.
                         Tentamen.
               V. GRAPHIPHORAE St. V. GRAPHIPHORAE 220
                                       Fam. B. PERSPICUAE 221-2
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                                                            ... 224
     [i.e. Graphiphora Hb. (1805).
                                      i.e. Episema Ochs. (1816).]
2058 cineta F.
                                        2247 Episema I-cinctum
                                                   Schiff. Hb. (144.)
         1 (type) Graphiphora gothica=2248
                                                   gothica L. (nun-
                                                     atrum Hb. 112).
                                        2249
                                                    tersa Schiff.
                                                         (Hb. 140.)
                                        2250
                                                   hirta Hb. (591.)
                                        2251
                                                   trimacula Schiff.
                                                       (Hb. 141-2.)
                                      =St. VI. AGROTES
                   VI. AGROTES
                                                            \dots 225
                                        Fam. B. DIFFAMATAE 226
                                        Coit. 3. Georyces
         [i.e. Agrotis Hb. (1805).
                                      i.e. Georyx Hb. (1822).]
              1 (type) Agrotis segetis=2280 Georyx segetum Schiff.
                                           (Hb. 147 segetis Hb. 146.)
                                       2281 Georyx corticea Schiff.
                                                         (Hb. 145.)
omitted.
                                                 unicolor Hb. (544.)
1358 cursoria Hfn.
                                       2283
                                                  cursoria Bkh.
                                                         (Hb. 540.)
                   VII. GLAEAE
                                     =St. VII.†GLOIAE (sic) 228
                                        Fam. C. BADIAE
                                       Coit. 1. ORRHODIAE ... 231
          [i.e. GLAEA Hb. (1805)
                                    i.e. Orrhodia Hb. (1822).
                                       2315 Orrhodia silene Schiff.
                                                         (Hb. 175.)
                                       2316
                                                  erythrocephala
                                                  Schiff. (Hb. 176.)
                                       2317
                                                  rubiginea Schiff.
                                                         (Hb. 183.)
              1 (type) Glaea vaccinii=2318
                                                   vaccinii L.
                                                        (Hb. 177.)
                                       2319
                                                  glabra Schiff.
                                                        (Hb. 438.)
                                      2320
                                                  serpylli Hb. 488.
                                      2321
                                                  polita Schiff.
                                                        (Hb. 178.)
                                      2322
                                                  spadicea Schiff.
                                                         (Hb. 179.)
                                       2323
                                                  cruda Schiff.
                                                        (Hb. 172.)
              VIII. XANTHIAE
                                    =St. VIII. XANTHIAE
                                      Fam. B. PLANAE
                                                           ... 234
                                      Coit. 2. CIRRHIAE
      [i.e. Xanthia Hb. (1805).
                                    i.e. CIRRHIA Hb. (1822).]
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Tentamen.
                                                Verzeichniss.
                                        2343 Cirrhia citrago L.
                                                       (Hb. 188.)
2144 sulphurago =1 (type) Xanthia *fulvago 2344
                                                 *fulvago L.
        Schiff.
                                              (sulphurago Hb. 194.)
                                       =St. IX. COSMIAE
                  IX. COSMIAE
                                                             ... 235
                                         Fam. A. COMMUNES
                                                                235
                                         Coit. 1. CALYMNIAE ... 235
            [i.e. Cosmia Hb. (1805).
                                         i.e. CALYMNIA Hb. (1822).
                                        2350 Calymnia trapezina L.
                                                         (Hb. 200.)
                1 (type) Cosmia affinis = 2351
                                                      affinis L.
                                                          (Hb. 201.)
                  X. BOMBYCIAE
                                       =St. X. BOMBYCIAE ... 236
                                         Fam. B. PAVIDAE ... 237
                                         Coit. 2. Palimpsestes
       [i.e. Bombycia Hb. (1805).
                                    i.e. Palimpsestis Hb. (1822).7
                                         2357 Palimpsestis octoge-
                                            sima Hb. Btr. (Hb. 209.)
                  1 (type) Bombycia or=2358 Palimpsestis or Schiff.
                                                          (Hb. 210.)
                                         2359
                                                     flavicornis L.
                                                          (Hb. 208.)
                  XI. HELIOPHILAE = St. XI. HELIOPHILAE 238
                                        Fam. C. PALLIDAE ...240
                                        Coit. 4. LEUCANIAE: ... 241
         [i.e. Heliophila Hb. (1805).
                                        i.e. Leucania Ochs. (1816).]
                                        2389 Leucania lutosa
                                                            Hb. 232
            1 (type) Heliophila pallens = 2390
                                                    pallens L.
                                                          (Hb. 234.)
                                        2391
                                                    punctum
                                                        (? Hb. MS.)
                                        2392
                                                    obsoleta Hb. 233.
                                        2393
                                                    ectypa Hb. 231.
                                        2394
                                                    congrua Hb. 616.
                                                "
                                        2395
                                                    comma L. (tur-
                                               bida Hb. (†228) ‡328,
                                                 congener Hb. 618.)
                                        2396 Leucania L-album L.
                                                         (Hb. ‡327.)
                                        2397
                                                    albilinea Hb.
                                                       (Zutr. 337-8.)
                  XII. XYLENAE
                                      =St. XII. XYLAENAE 241-2
                                      Fam. B. COMMUNIFORMES 243
                                        Coit. 1. Septides
                [i.e. XYLENA Hb. (1805).
                                           i.e. Septis Hb. 1825.]
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Tentamen.	Verzeichniss.
1701 sublistrus=1 (type) Xylena Esp. *lythoxylea	=2416 Septis * lithoxylea
1690 monoglypha Hfn.	2417 ,, polyodon L. (radicea Hb. 82
1706 rurea F.	2418 ,, rurea F. (putris Hb. 241
	2419 ,, mucens (=Hb. Zutr. 415-6 Drni
	2420 ,, materina (? MS.
1694 lateritia Hfn.	2421 ,, lateritia Hfn.
	(molochina Hb. 74
XIII. TRIBONOPHORA	E=St. XIII. TRIBUNO.
	PHORAE 24
	Fam.B.INDISTINCTAE 24
	Coit. 1. Callaeniae 24
[i.e. Tribonophora Hb. (1805).	<i>i.e.</i> Callaenia Hb. (1825).]
1 (type) Tribonophora	=2445 Callaenia umbratica I
umbratica	(Hb. 263 2446 , lactucae Schiff
•	(Hb. 262
	2447 ,, lucifuga Schiff. (umbratica H)
	• 264
2235 praecana Er. ? Stgr.	2448 ,, chamomillae
	Schiff. (Hb. 261 2449 tanaceti Schiff.
	2449 ,, tanaceti Schiff. (Hb. 265
Tribus III. SEMIGEOMETRA	· · · · · · · · · · · · · · · · · · ·
	METRAE 24
I. PLUSIAE	=St. I. PLUSIAE 24
	Fam. B. INNARATAE 25
	Coit. 2. Diachrysiae 25
[i.e. Plusia Hb. (1805). i.	
	2494 Diachrysia aurifera
2542 chryson Esp.	Hb. 468 2495 , orichalcea F.
2042 Chryson Esp.	(chryson Hb.
	278.
1 (type) Plusia chrysiti	s=2496 ,, chrysitis L. (Hb. 272, 662-3.
	2497 ,, zosima Hb. 651
II. EROTYLAR	E=St. II. EROTYLAE 25
	Fam. A. SELECTAE 25
	Coit. 3. Emmeliae 254
1i.e. EROTYLAE Hh. (1805).	i.e. Emmelia Hb. (1825).]
2490 trabealis 1 (type) Erotyla 250	` ,
Sc.= sulphurea=	Schiff. (Hb. 291.)

Tentamen.	Verzeichniss.
III. ANTHOPHILA	E=St. III. ANTHOPHILAE 255
	Fam. B. BLANDAE 255
	Coit. 3. Porphyriniae
	=†Phorphyriniae 256
[$i.e.$ Anthophila Hb. (1805).	<i>i.e.</i> Porphyrinia Hb. (1825).]
2426 1 (type) Antophila purpurin	a=2527 (†2427) Porphyrinia purpurina Schiff. (Hb. 298.)
2425 rosea Hb. (1790) = rosina Hb. (1802)	2528 (†2428) Porphyrinia rosina Hb. 299
IV. HELIOTHENTES =	St. IV. HELIOTHENTES 258
	Fam. D. CELETES 261
	Coit. 2. Melicleptriae 262
[i.e. Heliothis Hb. (1805).	i.e. Melicleptria Hb. (1825)]
2323	2575 Melicleptria scutosa
2325	Schiff. (Hb.309.) 2576 ,, peltigera Schiff. (Hb. 310.)
2321	2577 ,, alphea Cram.
1 (type) Heliothis dipsace	ea=2578 ,, dipsacea L. (Hb. 311.)
2320	2579 ,, ononis Schiff. (Hb. 312.)
2315	2580 ,, cardui Hb. 313.
	St. V. MEROPIDES263
V. ASCALAPHAE	=St.VI. ASCALAPHAE 266
	Fam. A. FREQUENTES 266
	Coit. 6. Phoberiae 267-8
$\lfloor i.e.$ Ascalapha Hb. (1805).	i.e. Phoberia Hb. (1825).]
	2620 Phoberia punctularis Hb. 364.
2655 1 (type) Ascalapha lunari	
2657 tirhaca Cram. (1777)	2622 ,, tirrhaea F. (auricularis Hb. 321.)
=tirrhaea F. (1781)	2623 ,, atomaris Hb.
	Zutr. 75-6.
	2624 ,, rufimargo Hb. Zutr. 45-6.
VI. LEMURES	=St. VII. LEMURES 274
	Fam. B. RESTINGUENTES 275
	Coit. 3. Mormones 275
Mania Tr. (1825) Stgr. [i.e. § Lemur Hb. (1 [nec. Mania Hb. (1825).]	1805). i.e. Mormo Ochs. (1816).]

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Tentamen.
                                                Verzeichniss.
1870
               1 (type) §Lemur maura=2711 (type) Mormo maura L.
                                                          (Hb. 326.)
                  [§Homonymous with LEMUR L. (1758) MAMM.]
                VII. BLEPHARA = St. VIII. BLEPHARONIAE 276
                                        Fam. B. COCCINEAE... 276
                                        Coit. 3. ASTIOTAE
                                                            ... 277
                [i.e. Blepharum Hb. (1805). i.e. Astiotes Hb. (1825.]
CATOCALA
  Schrk. (1802)
2681
                                        2725 Astiotes dilecta Bkh.
                                                         (Hb. 388.)
2682
            1 (type) Blepharum sponsa = 2726
                                                    sponsa L.
                                                         (Hb. 333.)
2685
                                        2727
                                                   conjuncta Esp.
                                                         (Hb. 335.)
                                                    promissa Schiff.
2684 promissa Schiff.
                                                        (Hb.657-8.)
                                                   mneste Hb.
                                 (promissa Hb. 334, mneste Hb. 569.)
                    VIII. BREPHA
                                      =St. IX. † BREPHIAE
                                        Fam. B. VULGARES ... 279
                                        Coit. 1. Archiëares 279-80
                                      i.e. Archiearis Hb. (1825).
          [i.e. Prephos Hb. (1805).
2854
           1 (type) Brephos parthenias = 2745 Archiearis parthenias
                                                     L. (Hb. 341-2.)
2856
                                                 notha Hb. (343-4.)
2858 puella Esp.
                                              ,, spuria Hb. 345.
                  IX. EUCLIDIAE
                                      =St. X. EUCLIDIAE ... 280
                                        Fam. A. MACULATAE 280
                                        Coit. I. DRASTERIAE
                                                             280 - 1
            [i.e. Euclidia Hb. (1805).
                                        i.e. Drasteria Hb. (1825).]
                                        2749 Drasteria graphica
                                                   Hb. Zutr. 11-12.
                                        2750
                                                     archesia Cram.
                                        2751
                                                    cuspidea Hb.
                                                       Zutr. 69-70.
             1 (type) Euclidia glyphica = 2752
2589
                                                    glyphica L.
                                                         (Hb. 347.)
                                        2753
                                                     erechtea Cram.
           Phalanx V. GEOMETRAE = Phal. V. GEOMETRAE 282
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                                      =Trib. I. AMPLAE
                                                              282 - 3
                    I. HYLAEAE
                                      =St. I. HYLAEAE
                                                            ... 283
                                        Fam. A. BISTRIATAE
                                                               283
                                        Coit, 1. THERINAE
             [i.e. HYLAEA Hb. (1805).
                                        i.e. THERINA Hb. (1825).]
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Tentamen.
                                                  Verzeichniss.
3720 prosapiaria L. = 1 (type) Hylaea
                                          2766 Terina fasciaria L. (Hb.
=fasciaria(L.) Hb.
                               fasciaria =
                                                         4,446,5,447.)
                                          2767
                                                 " perfidaria [? = fervi-
                                               daria Hb. Zutr. 409-101
                     II. TERPNAE
                                        =St. II. TERPNAE
                                                               ... 284
                                          Fam. B. SUBTILES ... 285
                                          Coit. 1. HOLOTHALASSES 285
          i.e. TERPNE Hb. (1805).
                                   i.e. Holothalassis Hb. (1825).]
2866
            1 (type) Terpne papilionaria = 2779 (type) Holothalassis
                                               papilionaria L. (Hb. 6.)
          Both having the same type (papilionaria) it is obvious that
                   TERPNE Hb. (1805)=HOLOTHALASSIS Hb. (1825).
                                       =St. III. EUSARCAE ... 286
                     III. EUSARCAE
                                          Fam. B. DEROSAE
                                                               ... 287
                                          Coit. 5. Colotoides ... 288
             [i.e. Eusarca Hb. (1805).
                                          i.e. Colotois Hb. (1825).]
            1 (type) Eusarca elinguaria = 2802 Colotois elinguaria L.
3749
                                                             (Hb. 20.)
3746
                                          2803
                                                      pennaria L.
                                                             (Hb. 14.)
3748 tusciaria Bkh.
                                          2804
                                                      extimaria
                                                              Hb. 21.
3716
                                          2805
                                                      capreolaria
                                                    Schiff. (Hb. 204-5.)
                                        =St. IV. LARES
                        IV. LARES
                                                               ... 288
                                          Fam. B. INDULGENTES 290
                                          Coit. 5. THERINIAE ... 290
               [i.e. Lars Hb. (1805).
                                         i.e. Therinia Hb. (1825).]
                                          2818 Therinia lactucinaria
                                                Hb. (lactucina Cram.)
                                          2819 Therinia strigaria F.
3757
              1 (type) Lars sambucaria = 2820
                                                      sambucaria L.
                                                            (Hb. 28.)
                     V. EUTRAPELAE St. V. EUTRAPELAE
                                                                  291
                                          Fam. B. LUNULATAE
                                                                  292
                                          Coit. 2. SELENIAE
          [i.e. Eutrapela Hb. (1805).
                                          i.e. Selenia Hb. (1825).]
8733 bilunaria Esp.
                                          2885 Selenia illunaria
                                                            Hb. 36-7.
                                                     lunaria Schiff.
3734
             1 (type) Eutrapela lunaria = 2836
                                                        (Hb. 33, 451.)
                                          2837
                                                     delunaria
                                                              Hb. 34.
3735 tetralunaria Hfn.
                                         2838
                                                     illustraria
                                                              Hb. 35.
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Tentamen. Verzeichniss.
VI. ERASTRIAE =St. VII. ERASTRIAE 299
Fam. C. DERIVATAE 301
Coit. 1. Calothysanides 301
[i.e. Erastria Hb. (1805). i.e. Calothysanis Hb. (1825).]
3139 amataL.=1(type) Erastria amataria=2904 Calothysanis amataria L. (Hb. 52).
3093 imitaria Hb. 51 2905 ,, immitaria Hb. 51.
3086 2906 ,, exemptaria Hb. (strigilaria Hb. 109.)
3090 2907 Calothysanis emutaria Hb. 323.
Tribus II. TENUES = Trib. II. TENUES 301-2
I. CYCLOPHORAE=St. I. CYCLOPHORAE 302
Fam. A. APERTAE 302
Coit. 3. Codoniae 302-3
[i.e. Cyclophora Hb. (1805). i.e. Codonia Hb. (1825).]
2914 Codonia caecaria Hb.
(punctata Stoll.12.10.)
3108 1 (type) Cyclophora pendularia = 2915 Codonia pendularia L. (Hb. 66.)
3112 b. pupillaria Hb. 2916 ,, gyrata Hb. 434.
3113 porata F. 2917 , punctaria L.
(Hb. 67.) 3112 2918 ,, pupillaria
Нь. 69.
II. SPILOTAE =St. II. SPILOTAE 304
Fam. A. ORNATAE 304
Coit. 2. Rhypariae 305
[i.e. Spilota Hb. (1805). i.e. Rhyparia Hb. (18 26).]
1 (type) Spilota grossulariata = 2937 Rhyparia grossulariata aria Hb. (glossulariata
L., Hb. 81, 82.) 3691 2938 Rhyparia melanaria L. (Hb. 86.)
III. SPHECODAE = St. III. SPHECODAE 308
Fam. B. CALCINATAE 309
Coit. 1. Deiliniae 310
[i.e. Sphecodes Hb. (1805). i.e. Deilinia Hb. (1826).]
3713 1 (type) Sphecodes pusaria=2982 Deilinia pusaria L. (Hb. 87.)
3714 exanthemata Scp. 2983 ,, striaria Hb. 88.
[Tribus II. TENUES = Trib. I. AMPLAE 282-3.]
IV. CHLEUASTAE=St. VI. CHLEUASTAE 295
TITOTIONOLINE DI TITOLINE DI LE DE LE CONTRE

	Tentamen.		erzeichniss.
			NOBILES 297
			CATOGRAPTAE 297
_	JASTES Hb. (1805).		арта Hb. (1826).]
4001 1 (ty	pe) Chleuastes piniari	ia=2878 Cat	ograpta piniaria L. (Hb. 119, 120, 469, 470.)
3995		2879	, concordaria Hb. 126, 518-9.
	[Tribus II. TENUES	=Trib. II.	TENUES 301-2.]
	V. SCIADIA	=St. IV.†	SCIADIAE 312
		Fam. A.	DISTINCTAE 312
		Coit. 2. 8	SCOTOPTERICES 313
[i.e. Son	iadion Hb. (1805).	i.e. Scotopt	ERIX Hb. (1826).]
3925 1 (type) Sciadion furvari	ia=3019 Sco	otopterix furvaria Hb. (furvata Schiff., Hb. 144.)
3931			otopterix obscuraria o. (obscurata Schiff., Hb. 146.)
39 35a -		в 02 1 Sec Н	otopterix pullaria b. (pullata Schiff., Hb. 145.)
4005		3022 Sec	otopterix taenio- laria Hb. 357.
3965 myrtillata	Chnbg.	3023	,, limosaria Hb.
	,	3024	" canaria Hb. 344.
8927		3025	respersaria Hb. 406.
	VI. CYMATOPHORA	E=St.V.CY	MATOPHORAE 315
		Fam. A.	PROLIXAE 315
		Coit. 2.	Dryocoetides 316
ſi.e. Cyma	торнова Нв. (1805).	i.e. Dryoco	етіз Нь. (1826).]
3894 · 1 (type)	Cymatophora roborar	ia=3043 Dr	yocoetis roboraria Schiff. (Hb. 169.)
3895		3044	" consortaria F. (Hb. 168.)
		3045	,, virginiaria Cram. 275 G.
		3046	" carinentaria Hb. (carinenta Cram. 128 F.)
		3047	" umbrosaria Hb.
3874		3048	" cinctaria Schiff. (Hb. 166.)

Ten	tamen.		Verz	eichniss.	
		3049	25	dianaria	
3900-jubata Thnbg.		(3050	,,	glabraria	48 3. Hb.
		2051		tomonouio	162.
		(3051	27	teneraria	348.
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		Fam. A			010
				CIFORME	
[i a Diamya H]	(1905)	Coit. 1.			318
[i.e. Pachys H] 3826 strataria Hfn. 1 (type) Pa				A Hb. (182 a prodrom	
prod	romaria=	0072 12	ubyja S	chiff. (Hb	. 172.)
3832		3073		betularia l	Lie 🐪
II. EPIR	ישראידים.	_S+ TT 1	מזמים	IRITAE .	. 173.)
11. 151 111	WILAH .			ANDICULA	
		Coit. 2.			321-2
[i.e. Epirrita Hb.	(1805).	i.e. Opo	RINIA	Hb. (182	6).]
9380 1 (type) Epirri				,	-
<u> </u>		3101		Schiff. (Hk	,
0240		9101	,, ;	sertata-Ht 4	89-90.
3398 verberata Scp.		3102	,, r	upestrata	
3358 didymata L.		3103	·,, · · · 8	alpestrata	. 192.) Hb.
		0104			320.
32 36		3104		polycomm Schiff.(Hb	
III. RHEUMAPTE	ERAE=St.	III. RHI		,	•
•		Fam. B	. RIV	VATAE .	327
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3447 1 (type) Rheumapte	ra hastata:	=3169 E	ulype		
3447a		3170	·,,]	hastulata	. 256.) Hb. 356.
3450 luctuata Hb.		3171	,,	tristata L	
3451 pupillata Thnbg.		3172	"	funerata I	
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IV. HYD	RIAE	=St. IV.			329
		Fam. A		OCALPAE .	329
[i.e. Hydria Hb. (1805).			Hb. (182	
- '	'			,	

	Tentamen. Verzeichniss.
3270	1 (type) Hydria undulata = 3182 Calocalpe undulata L. (Hb. 262, 436).
	[Both having the same type (undulata L.), it is obvious that Hydria Hb. (1805)=Calocalpe Hb. (1826).]
	V. PETROPHORAE St. V. PETROPHORAE 332
	Fam. C. NORMALES 334
	Coit. 1. ONYCHIAE 334
	[i.e. Petrophora Hb. (1805). i.e. Onychia Hb. (1826).]
3159	3221 Onychia peribolata Hb. 471.
3156	moeniata Scp. 1 (type) Petrophora 3222 ,, moeniata Hb. maeniata = (moeniaria Schiff., Hb. 298.)
	Phalanx VI. PYRALIDES=Phal. VI. PYRALIDES 339
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	[nec. I. SALIAE Hb. Tent.]
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	Fam. B. RECTIPALPES 344
	Coit. 1. Pechipogines 344-5
	[i.e. Erpyzon Hb. (1805). i.e. Pechipogo Hb. (1826).]
n. syn	plumigeralis Hb. (1826) .=crinalis Tr. (1829) Stgr. Cat. barbalis Cl. 3299 Pechipogo plumigeralis Hb. 18.) (*barbalis Hb. 18.) 3300 , pectitalis Hb. 122
	II. SALIAE = [St. II. HERPYZONTES (p.) 348]
	[nec. I. SALIAE Hb. Verz. 339.]
	Fam. A. CURVIPALPES 343
	Coit. 3. Colobochylae 344
	[i.e. Salia Hb. (1805). i.e. Colobochyla Hb. (1826).]
27 90	1 (type) Salia salicalis=3293 (type) Colobochyla salicalis Schiff. (Hb. 3.)
	[The type of both being salicalis, it is obvious that Salia Hb. (1805)=Colobochyla Hb. (1826). Saliae Hb. Verz. 339 does not contain the type of Salia Hb. Tent., and Saliae and ERPYZONES are united under HERPYZONTES.]
	Tribus II. VULGARES=Trib. II. DIFFORMES 345
	[cf. VULGARES Hb. Verz. 352.]
	I. HELIACAE =St. II. HELIACAE 349
	Fam. A. PURPUREAE 349
	Coit. 3.†Porphyriten 349-50
	[i.e. Heliaca Hb. (1805). i.e. Porphyritis Hb. (1826).]

	Tentamen.	~ V	erzeichniss.
1251			phyritis purpuralis L. (Hb. 113, 35, 34.)
1253 aurata Scp	. 1 (type) Heliaca	∫3345 ,,	punicealis Schiff.
	purpuralis	= 1	(porphyralis Hb. 36.)
1248		3346 ,,	porphyralis
			Schiff. (coccinalis Hb. 37.)
[Tribu	is II. VULGARES (p.)] = Trib. III.	VULGARES 352
	II. ELOPHILAE		LOPHILAE 361
			ORNATAE 363
			ATACLYSTAE 363
	LOPHILA Hb. (1805).		STA Hb. (1826.)]
922 lemnataL.	1(type)Elophilalimnali	is=3468 Cata	aclysta lemnalis Schiff. (Hb. 83-4).
		3469 ,,	· C 1' TT1
			inauralis Hb.
	III. PALPITAE	=St. I. PA	
	THE TABLITAD	Fam. E.	
			URRHYPARAE 360
[<i>i.e.</i> P	ALPITA Hb. (1805).	i.e. Eurrhyp	ARA Hb. (1826).]
443 urticata L.	1 (type) Palpita urticali	s=3451 Eur	
	L. being the type of bot	h, Palpita E	Schiff. (Hb. 78.) Ib. (1805)=EURRHY-
	A Hb. (1826).] ibus III. $DIFFORME$	S-Trib II	DIFFORMES 345
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		Coit. 3. S	
	[i.e. Idia Hb. (1805).		ене Нь. (1826).]-
893	1 (type) Idia bombycali		aphe bombycalis hiff. (Hb. 20, 124.)
891 moldavica	Esp.		aphe netricalis
901 connectalis	Hb.	3323 ,,	Hb. 158.
908		3324 ,,	Hb. 91. angustalis Schiff.
,		,,,	/HI 01 102 \-
0.91		3325 ,	munotalia Cabiff
931		3326 ,,	punctalis Schiff. (Hb. 140.)
885 brunnealis	Tr.	3327 ,,	comparalis Hb. 126.
1115		3 328 ,,	suppandalis
		,,	Hb. 187-190.

4098 4108

4105 4112 4117

4113 albula Schiff.

Tentamen.

Verzeichniss.

3329 Synaphe corticalis Schiff. (Hb. 155.)

[[Phalanx VI. PYRALIDES (p.)=Ph	hal. V	II. TORTRICES 372]
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		Coit.	1. Roeseliae 397
	[i.e. Chlamiphora Hb. (1805).	i.e. Ro	eselia Hb. (1826).]
3 t	togatulalis Hb.	3844	Roeselia togatulana
3 6	cucullatella L. 1(type) Chlamiphora palliola = (3845	Hb. (131.) ,, cucullatana Hb. (palliolalis Hb. 18, 149.)
s s	strigula Schiff.	3846	,, strigulana Hb.
2 (cristatula Hb.	3847	(strigulalis Hb. 16.) ,, cristulana Hb. (cristulalis Hb. 17.)
7 (centonalis Hb.	3848	" centonana Hb. (centonalis Hb. 15.)

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3849

=St.I. HEMEROPHILAE 373 I. HEMEROPHILAE

Fam. A. PYRALIDIOIDES 373

Coit. 1. Choreutes ... 373

albulana Hb.

(albulalis Hb. 14.)

i.e. Choreutis Hb. (1826).] [i.e. Hemerophila Hb. (1805)

2316 3574 Choreutis diana Hb. 274.

2315 pariana Cl. 1 (type) Hemerophila

pariana = 3575 pariana L.

(Hb. 2, 1.) 2318 fabriciana L. urticana Schiff. 3576

(dentana Hb. 4, 5.)

2314 3577 nemorana Hb. 3. 2313 myllerana F. 3578 scintilulana Hb. (augustana Hb. 204.)

II. OLETHREUTAE =St. II. OLETHREUTAE 374

Fam. A. GEMMATAE... 374

Coit. 1. Eucosmae ... 374

[i.e. OLETHREUTES Hb. (1805). i.e. Eucosma Hb. Zutr. (1823).]

Tentamen. Verzeichniss.
1896 arcuella Cl. 1 (type) Olethreutes
arcuana = 3586 Eucosma arcuana L. (Hb. 33.)
[(1) OLETHREUTES Hb. Tent. (1805), type arcuella L.
(2) Eucosma Hb. Zutr. II. 28 (1823), type Eucosmo circulana Hb. [Zutr. II. 363-4 (1823).]
These two genera are distinct and founded on different types. "Tortrix lasciva, Olethreutes gemmata, Eucosma circulana Hb." dates from the Second Century of the Zuträge (1823).]
[St. III. EUTRACHIAE 383.]
III. ARCHIPES =St. IV. ARCHIPES 388
Fam, A. FLORIPERDAE 388
Coit. 2. Pandemides 388-9
[i.e. Archips Hb. (1805). i.e. Pandemis Hb. (1826).]
1508 3772 Pandemis reticulana
Hb. 271.
1538 corylana F. 3773 , textana Hb. 115.
1540a 3774 " cerasanaHb.119.
1506 piceana Li. 1 (type) Archips
oporana=3775 "oporanaL.(Hb.112.) 1515
1547 heparana Schiff. 3777 , pasquayana
Schiff. (carpiniana
Hb. 116.) 1540 3778 ribeana Hb. 114.
1540 3778 ,, ribeana Hb. 114. 1575 3779 ,, croceana Hb. 120.
1578 3780 ,, pronubanaHb.121.
St. V. AGAPETAE 3911
Tribus II. PIGRAE = Trib. II. PIGRAE 394
I. NYCTEOLA =St. I. NYCTEOLAE 394
Fam. A. VARIABILES 396
Coit. 1. Axiae 395
[i.e. Nycteola Hb. (1805). i.e. Axia Hb. (1826).]
(3383 Axia dilutana Hb. 6. (3834 ,, revayana Schiff.
(=undulana
Hb. 7.)
4126 revayana Schiff. (3835 ,, punctana Hb. 9.
(=Hb. Verz. 3383-7) 3836 ,, romosana Hb. 10.
1 (type) Nycteola degenerana 3837 ,, degenerana
Hb. 8.
[The type of Axia is revayana Schiff., the genus being founded on
five varieties of that species; revayana is also the type of Nycteola, it therefore follows that Nycteola Hb. (1805)=Axia Hb. (1826).]
" Therefore tollows what it to both it is (1000) — Alia itis (1020).]

Tentamen.

II. PSEUDOIPES

Verzeichniss.

Fam. B. MAJORES ... 396

395

=St. II. PSEUDOIPES

	Coit. I. Hylophilae 396
i.e. Pseudoips, Hb. (1805).	i.e. Hylophila Hb. (1826.)]
4141	3842 Hylophila prasinana L. (Hb. 158.)
1142 bicolorana Fuessl. 1 (type) Pseu	
quercan	a=3843 ,, quercana Schiff. (Hb. 159.)
III. COCHLIDIA	=St. IV. COCHLIDIAE 397
	Fam. A. BOMBYCOIDES 397
	Coit. 1. Cheloniades 397-8
[i.e. Cochlidion Hb. (1805).	i.e. Chelonias Hb. (1826).]
440 limacodes Hfn. 1 (type) Cochlidi	ion
testude	o=3850 Chelonias testudinana Hb. 164-5.
4443 asella Schiff.	3851 " asellana Hb.
	166-7.
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Phalanx VIII. TINEAE	
	=Trib. I. CERTAE 398
I. CANEPHORAE	=St. I. CANEPHORAE 398
	Fam. A. VERAE 399
51 G TTI (100H) I	Coit. 1. Sterrhopterices 399
[i.e. Canephora Hb. (1805). i.e.	
450 unicolor Hfn. 1 (type) Canephor	a=3854 Sterrhopterix vestitella
grammont	F.(graminellaHb.1.)
488 hirsutella Schiff. (Hb.)	3855 ,, calvella Ochs.
	(hirsutella Hb. 3.)
(7)L_1	DILL WIL MARKRIANC 0701
[Phal. VIII. TINEAE contd. =	= Phal.VII. TORTRICES 372]
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	Fam. C. DUBIAE 387
TI (100m)	Coit. 3. Exapatae 387
[i.e. Enyphantes Hb. (1805).	i.e. Exapate Hb. (1826).]
641 congelatella Cl. 1 (type) Enypha gelatella	ntes = 3765 (type) Exapate gelatana Hb. 266.
tella Cl.; in the Verz	1805) was proposed for congela- zeichniss the Stirps is changed , the type being placed in the *ENYPHANTAE Hb. is used

erroneously in the Verzeichniss (p. 402) as a Stirps of TINEAE to include the Coiti Semioscopis Hb., Chimabache Hb., Cheimophila Hb. and Symmoca Hb., neither of which are congeneric with Enyphantes congela-

Verzeichniss.

Tentamen.

tella Cl.

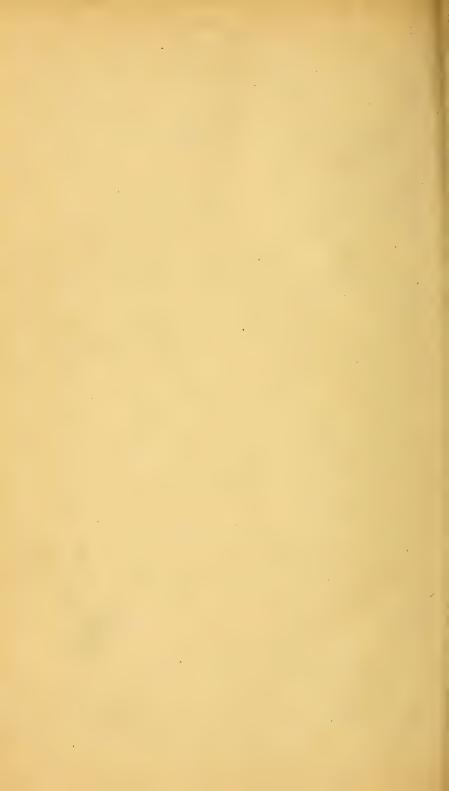
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                                       =Trib. I. CERTAE
                                                               3987
                                       =St. IV. BROSEES
                                                             ... 403
                    III. BROSEES
                                         Fam. B. VASTIFICAE
                                                                403
                                         Coit. 1. DIAPHTHIRUSAE 404
           [i.e. Brosis Hb. (1805).
                                      i.e. Diaphthirusa Hb. (1826).
4555
                1 (type) Brosis granella = 3890 (type) Diaphthirusa
                                              granella L. (Hb. 165.)
            These two genera having the same type Tinea granella L.,
                it follows that Brosis Hb. (1805)=Diaphthirusa Hb.
                                                             ... 400
                                       =St. II. SETES
                       IV. SETES
                                         Fam. A. NOTAE
                                                             ... 400
                                         Coit. 1. Autosetes
                                                             ... 401
                                         i.e. Autoses Hb. (1826).]
                [i.e. Ses Hb. (1805).
4584
                1 (type) Ses pellionella=3869 Autoses pellionella L.
                                                            (Hb. 15.)
                                         3870
                                                      sarcitella L.
            Hübner did not figure sarcitella L. (Roesel), it is therefore
                presumable that he did not know the species and that
                Tinea pellionella was the actual type of SES Hb. (1805)
                and Autoses Hb. (1826).
                                      = Phal.VI. PYRALIDES 339]
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                                                                 364
                                         Coit. 1. CATOPTRIAE ... 365
                                        i.e. CATOPTRIA Hb. (1826).]
        [i.e. Tetrachila Hb. (1805).
79 margaritellus Hb.
                                         3487 Catoptria emargaritalis
                                                     (margaritella
                                                            Hb. 39.)
83 pinellus L. 1 (type) Tetrachila
                              conchella=3488
                                                    pinetalis (con-
                                                       chella Hb. 38.)
                                         3489
                                                    conchalis (myel-
87 myellus Hb.
                                                         lus Hb. 37.)
                                         3490
                                                    mytilalis (mytil-
84 mytilellus Hb.
                                                        ella Hb. 287.)
```

Tentamen. 89 speculalis Hb. (1826)	Verzeichniss.
00 speculans 110. (1020)	3491 Catoptria speculalis
90 luctiferellus Hb.	(pinetella Hb. 36.) 3492 ,, luctiferalis
	(luctiferella Hb. 324.)
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·	=Trib. II. INCERTAE 404
II. HYPHANTAE =	St. II. COENOPHANTAE 409
	Fam. B. OBTUSAE 410
	Coit. 7. Nygmiae 412
[i.e. Hyphantes Hb. (1805).	i.e. Nygmia Hb. (1826).]
2366 padi Z. 1 (type) Hyphantes	
evonymella	=3984 Nygmia evonymella L.
2365 evonymella L.	(Hb. 88.) 3985 ,, cagnatella Hb.
2358	(391, 392, 87.)
2360	3986 ,, irrorella Hb. 93. 3987 ,, rorella Hb. 234.
2359	3988 ,, padella L.(Hb.393-5.)
2857	3989 " plumbella Schiff.
Tribus III. MIRABILES:	(Hb. 86.)
-1. ELIADRIA	=St. III. ELASMIAE 415 Fam. A. MIRANDAE 415
	Coit. 2. Eutyphiae 416
[i.e. Elasmion Hb. (1805).	i.e. Ептурніа Hh. (1826).]
4721 degeerella L. 1 (type) Elasmion	201111111 11 (1020).]
geerella=	=4031 Eutyphia geerella Hb.
1717 croesella Scp.	130, 446.
	4032 ,, sulzella L. (Hb. 121.)
4726	4033 ,, ochsenheimer-
Tribus III MIDADII ES.	ella Hb. 359.
II COLFORDORA	=Trib. III. MIRABILES 421
21. COLECTIONAE	St. III. COLEOPHORAE 426
· ·	Fam. C. VULGARES 427 Coit. 1. HAPLOPTILIAE 428
[i.e. Coleophora Hb. (1805).	i.e. Haploptilia Hb. (1826).]
2001	4168 Haploptilia coracipen-
	nella Hb. 208.
[?3648]	4169 " gryphipennella
1058	Hb. 206. 4170 ,, rufipennella
[?3680 spissicornis Hw.]	Hb. 204.
TOOO SPISSIOOTHIS IIW.]	4171 ,, mayrella Hb. 322.

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	41	172	Нар	loptilia s ella	Hb. 38	50.
4209	41	L73	"	complar	nella H	b. 28.
3633		174	,,	laricella	Hb. 45	27.
3799	1 (type) Coleophora anatipennella=41	175	,,	anatipe	nnella Hb. 1	8 6.
4024	4.	176	22	cygnipe	nnella Hb. 2	07.
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					28	59.)
[?4120]	1 (type) Phyllonorycter rajella=4	118		" rajel	la L. (Hb. 20	00.)
4190	4	119		" kleen	nannell (Hb. 20	aF.
[?4118]		120		" alni	foliella	Hb.
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1344				iptilia ga	lacto-	
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1348	1 (type) Pterophora pentadactyla =	419	1	" penta	adactyla (Hb	L.
1365 tet	tradactyla L.	419	5	" theio	dactyla	Hb
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	[i.e. Ripidophora Hb. (1805). i	.e. E	UCH	iradia H	b. (182)	б). J

1 1	Tentamen.			ichniss.
1438 hübneri Wlgrn.	1 (type) Ripido-	1196 Eu	chir	adia hexadac-
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				11, 30, 31.)
1433	4	197	,,	dodecadactyla
				Hb. 29.
1437 hexadactyla L.	. 4	198	,,	polydactyla
. 0				Hb. 28.

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SPECIAL INDEX.

By H. J. TURNER, F.E.S.

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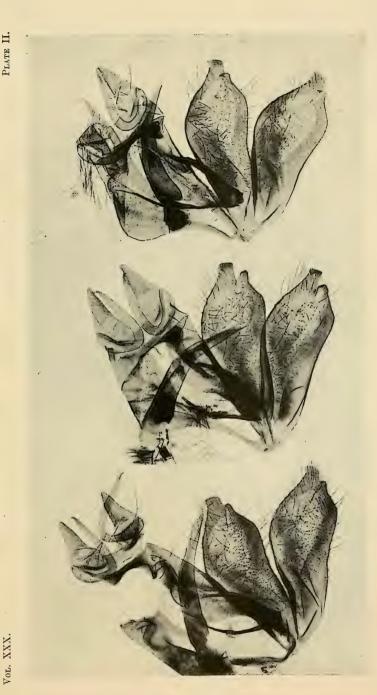
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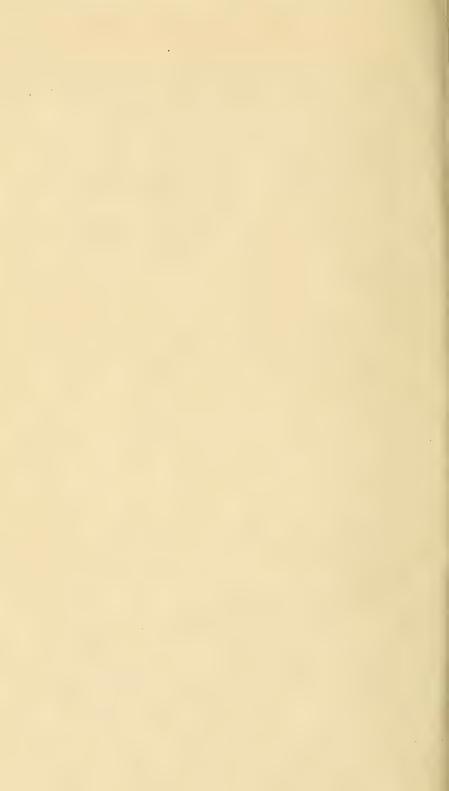
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25.	. 19.5	21.	For 7	Triscotia read Triscolia.		
9.0		13.		rion read arion.		
50				'larvæ'' read "larva."		
60	"		Note.	-Correction. Vol. xxix., p. 229		
0.0				Ponevinae read Ponerinae.		
00	,,			gure is upside down.		
100		42.		cophora read Rhynchota.		
1/10				lands read Birklands.		
149		38.		read Telea.		
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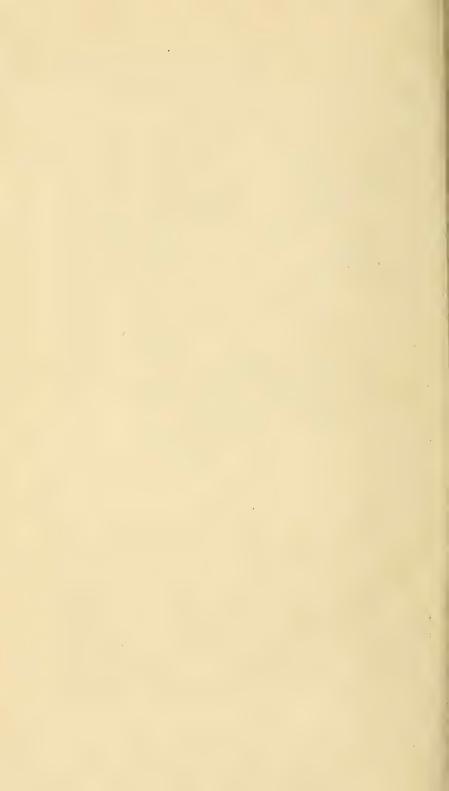




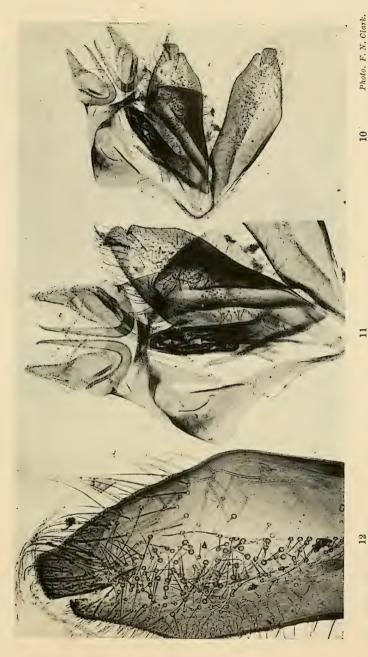
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PLEBEIUS SAREPTENSIS, N.SP.



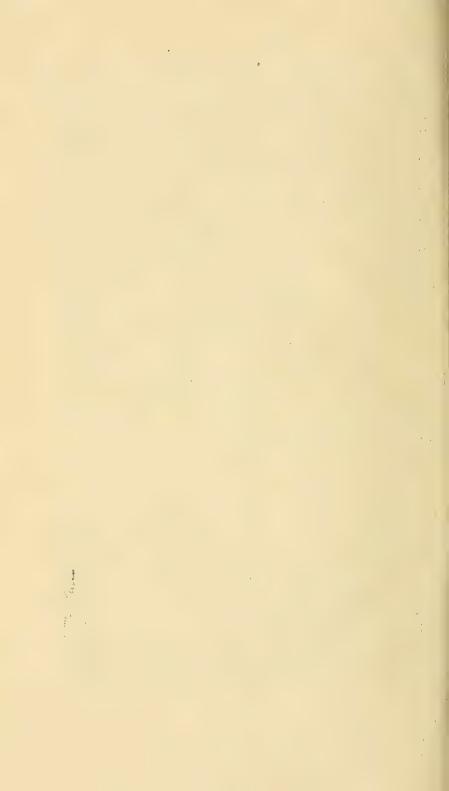
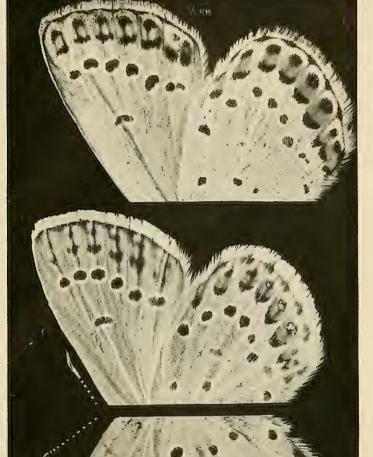


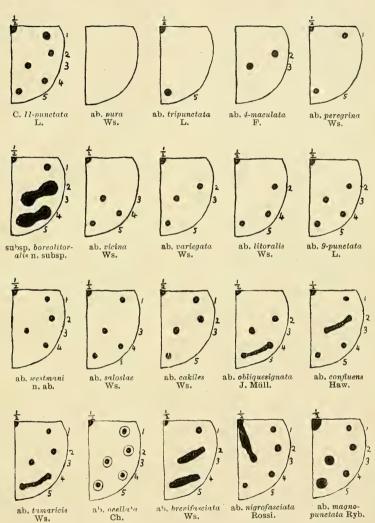
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Vol. XXX. Plate VII.

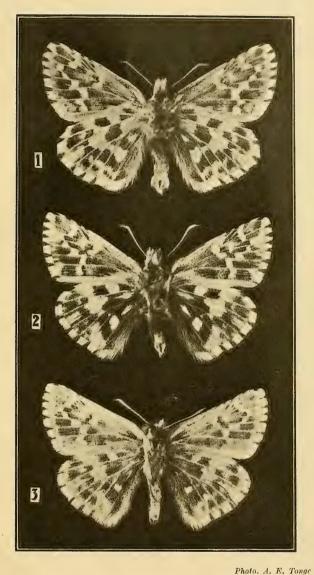


Coccinella 11-punctata L_{\cdot} , with its subspecies and aberrations. (Diagrammatic.)

Ent. Rec.]

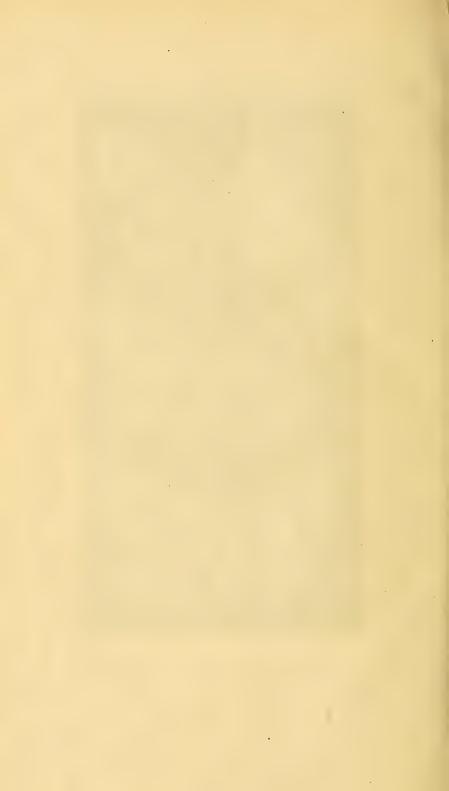


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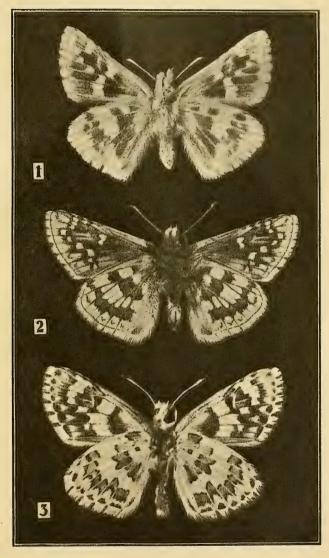


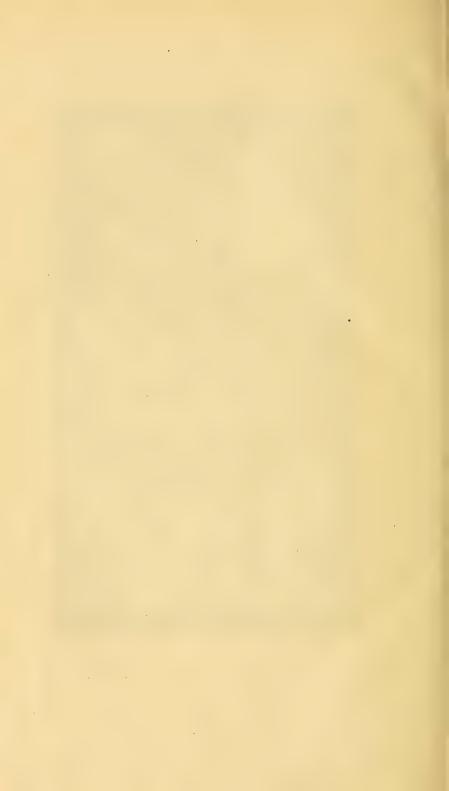
Undersides Hesperia. 1, Centaureae. 2. Andromedae. 3, Sibirica × 2.

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Vol. XXX. PLATE X.

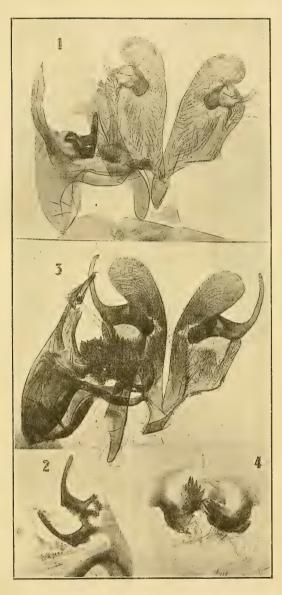


Photo F. N. Clarke.

HESPERIA & APPENDAGES.

1. Onofordi × 20. 3. Serratulae × 20. 2. × 30. 4. ... × 30. 2. ,, $\times 30.$

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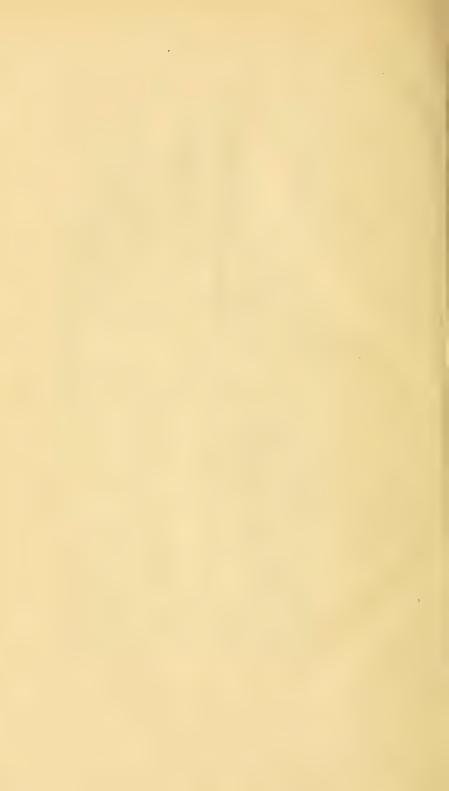
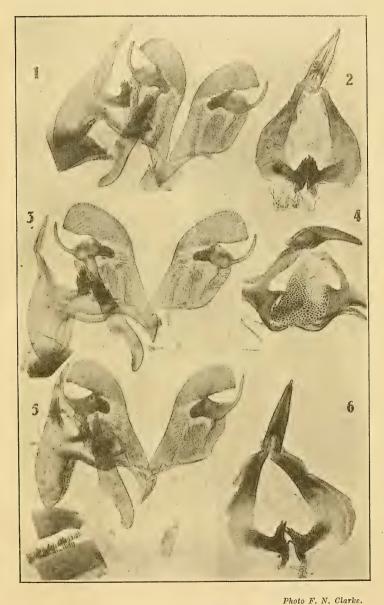
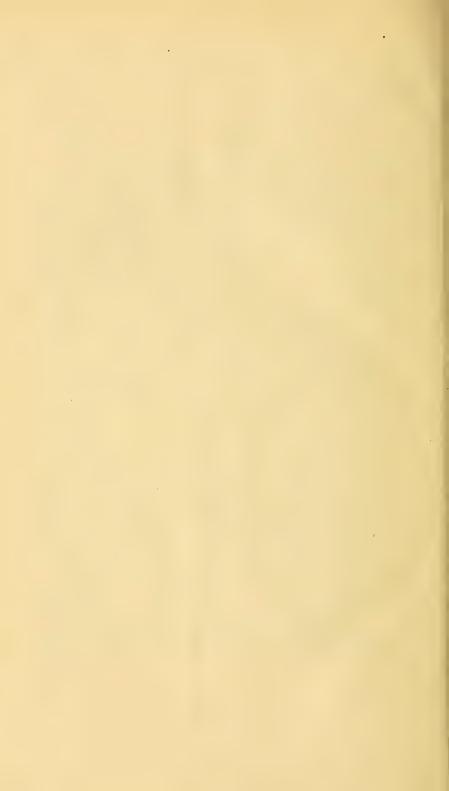
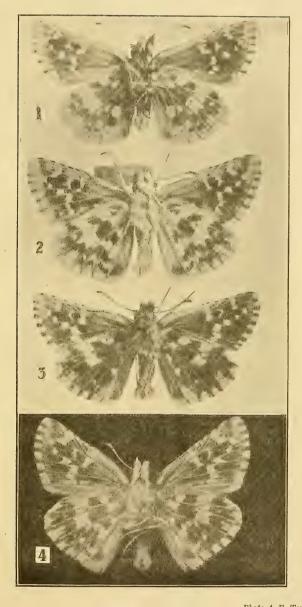


PLATE XI. Vol. XXX.



HESPERIA, & APPENDAGES. 1 and 3. Fritillum × 15. 2. Fritillum × 30. 4. Carthami × 30. 5. Carlinae \times 15. 6. Carlinae \times 30. Entomologists", Record.





HESPERIA UNDERSIDES.

 $Photo\ A.\ E.\ Tonge.$

1. Serratulae. 2. Onofordi. 3. Carlinae. 4. Fritillum $\times 2$. Entomologists' Record.





